RCRA ~~PART B~~ PERMIT

FOR THE

IDAHO NATIONAL LABORATORY

Volume 14
INTEC Liquid Waste Management System

Attachment 2, Section C
Waste Characteristics

Revision Date: ~~January 23,~~ August 2006

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EXHIBITS

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APPENDICES

ACRONYMS AND ABBREVIATIONS

ACMM	Analytical Chemistry Methods Manual
ALARA	as low as reasonably achievable
APHA	American Public Health Association
APS	Atmospheric Protection System
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant
CRR	Carbon Reduction Reformer
DEQ	(Idaho) Department of Environmental Quality
DMR	Denitration and Mineralization Reformer
DOE	Department of Energy
DOT	Department of Transportation
DQO	data quality objective
EMCAP	Environmental Management Consolidated Audit Program
EPA	Environmental Protection Agency
ETS	Evaporator Tank System
FR	(WDS) Facility Representative
g	gram
GAC	granular activated carbon
gal	gallon
HEPA	high efficiency particulate air
hr	hour
HWMA	Hazardous Waste Management Act
HWN	hazardous waste number
IDAPA	Idaho Administrative Procedures Act
ILWMS	INTEC Liquid Waste Management System

INL	Idaho National Laboratory
INEEL	Idaho National Engineering and Environmental Laboratory
~~ILWMS~~	~~INTEC Liquid Waste Management System~~
INTEC	Idaho Nuclear Technology and Engineering Center
IWTU	Integrated Waste Treatment Unit
kg	kilogram
L	liter
lb	pound
LDR	Land Disposal Restriction
LET&D	Liquid Effluent Treatment and Disposal
~~M&O~~	~~management and operating~~
mg	milligram
Mg	megagram
MSDS	Material Safety Data Sheet
NA	not applicable
NGLW	newly generated liquid waste
NIOSH	National Institute for Occupational Safety and Health
NRC	Nuclear Regulatory Commission
NWCF	New Waste Calcining Facility
PEW	Process Equipment Waste
PEWE	Process Equipment Waste Evaporator
PK	process knowledge
ppm	parts per million
ppmw	parts per million weight
PWL	Process Waste Liquid
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RAL	Remote Analytical Laboratory

RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SVOC	semi-volatile organic compound
TBP	tributyl phosphate
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TFF	Tank Farm Facility
TOC	total organic carbon
TSS	total suspended solids
UHC	underlying hazardous constituent
VOC	volatile organic compound
VOG	vessel offgas
WAC	waste acceptance criteria
WAP	Waste Analysis Plan
WDDF	Waste Determination and Disposition Form
~~WDS~~WGS	Waste ~~Disposition~~ Generator Services
WTS	waste technical specialist
WWH	Westside Waste Holdup (Tanks)

C. WASTE CHARACTERISTICS

This section has been prepared for the Idaho Nuclear Technology and Engineering Center (INTEC) Liquid Waste Management System (ILWMS) located at the Idaho National Laboratory (INL) Site. ~~Three~~ Four process codes are associated with the regulated hazardous waste management units in the ILWMS. The process codes are S01, container storage; S02, tank storage; T01, tank treatment; and X99, other miscellaneous treatment. The purpose of this section is to describe the process and rationale utilized by the ~~management and operating (M&O)~~ Department of Energy (DOE), Idaho Operations Office-designated contractor to determine the physical and chemical characteristics of the wastes managed at these units. This section describes hazardous wastes and only the hazardous components of mixed wastes regulated by the Resource Conservation and Recovery Act (RCRA), Idaho Administrative Procedures Act (IDAPA), and the Code of Federal Regulations (CFR).

The ILWMS includes the Process Equipment Waste Evaporator (PEWE) system, the Liquid Effluent Treatment and Disposal (LET&D) facility, ~~and~~ the Evaporator Tank System (ETS), and the Integrated Waste Treatment Unit (IWTU). The ILWMS includes tanks and ancillary equipment in Buildings CPP-604, CPP-641, CPP-649, CPP-659, CPP-601, CPP-1618, CPP-1619 truck unloading area, CPP-1696, and associated valve boxes.

Detailed descriptions of the PEWE, LET&D, ~~and~~ ETS, and IWTU are provided in Attachment 1, Section D of this ~~Part B~~ Permit. The regulated tanks and ancillary equipment ~~to be permitted as~~ associated with the ILWMS are listed below:

The regulated tanks and ancillary equipment specific to the PEWE system include:

- VES-WL-132, CPP-604 Evaporator Feed Sediment Tank (regulated under IDAPA as a storage/treatment tank)
- VES-WL-133, CPP-604 Evaporator Feed Collection Tank (regulated under IDAPA as a storage/treatment tank)
- VES-WL-102, CPP-604 Surge Tank for VES-WL-133 (regulated under IDAPA as a storage/treatment tank)
- VES-WL-109, CPP-604 Evaporator Head Tank (regulated under IDAPA as a storage tank).
- EVAP-WL-129, CPP-604 Evaporator Unit, including VES-WL-129, VES-WL-130, HE-WL-307, and HE-WL-308 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)

- VES-WL-134, CPP-604 Process Condensate Surge Tank (regulated under IDAPA as a storage tank)
- EVAP-WL-161, CPP-604 Evaporator Unit, including VES-WL-161, VES-WL-162, HE-WL-300, and HE-WL-301 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)
- VES-WL-131, CPP-604 Process Condensate Surge Tank (regulated under IDAPA as a storage tank)
- VES-WL-108, CPP-604 Process Offgas Condensate Knock Out Pot (regulated under IDAPA as a storage tank)
- VES-WL-111, CPP-604 Bottoms Collection Tank (regulated under IDAPA as a storage/treatment tank)
- VES-WL-101, CPP-604 Bottoms Collection Tank (regulated under IDAPA as a storage/treatment tank)
- VES-WL-103, VES-WL-104, and VES-WL-105, CPP-641 Westside Waste Holdup Tanks (regulated under IDAPA as storage/treatment tanks)
- VES-WM-100, VES-WM-101, and VES-WM-102, CPP-604 Tank Farm Tanks (regulated under IDAPA as storage/treatment tanks)
- VES-WG-100, VES-WG-101, VES-WH-100, and VES-WH-101, CPP-601 Deep Tanks (regulated under IDAPA as storage/treatment tanks)
- VES-WL-135 (DVB-OGF-D5), VES-WL-136 (DVB-OGF-D8), VES-WL-137 (CPP-649), VES-WL-138, VES-WL-139, VES-WL-142, VES-WL-144 and VES-WL-150 (CPP-604), Process Waste Liquid Collection System (regulated under IDAPA as storage tanks)
- VES-WL-106, VES-WL-107, and VES-WL-163, CPP-604 Process Condensate Collection Tanks (regulated under IDAPA as treatment/storage tanks).

The regulated tanks and ancillary equipment specific to the LET&D facility are listed below:

- VES-WLK-197, CPP-1618 Acid Fractionator Waste Feed Head Tank (regulated under IDAPA as a storage tank)
- FRAC-WLL-170, CPP-1618 Acid Fractionator, including FRAC-WLL-170, HE-WLL-391, HE-WLL-396, HE-WLL-398, and VES-WLL-198 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)
- FRAC-WLK-171, CPP-1618 Acid Fractionator, including FRAC-WLK-171, HE-WLK-392, HE-WLK-397, HE-WLK-399, and VES-WLK-199 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)

- VES-WLL-195, CPP-1618 Acid Fractionator Bottoms Tank (regulated under IDAPA as a storage tank)

- VES-NCR-171, CPP-659 Annex LET&D Nitric Acid Recycle Tank (regulated under IDAPA as a storage tank)

- VES-NCR-173, CPP-659 Annex LET&D Nitric Acid Recycle Head Tank (regulated under IDAPA as a storage tank).

The regulated tanks and ancillary equipment specific to the ETS facility are listed below:

- VES-NCC-152, CPP-659 Constant Head Feed Tank (regulated under the IDAPA as a storage tank)

- EVAP-NCC-150, CPP-659 (which includes VES-NCC-150, HE-NCC-350, HE-NCC-351), (regulated under the IDAPA as a miscellaneous treatment (evaporation) unit with tank storage)

- VES-NCC-101, CPP-659 Blend Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-102, CPP-659 Hold Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-103, CPP-659 Hold Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-119, CPP-659 Fluoride Hot Sump Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-122, CPP-659 Non-Fluoride Hot Sump Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-108, CPP-659 Scrub Hold Tank (regulated under the IDAPA as a storage/treatment tank)

- VES-NCC-136, CPP-659 Vent Condenser Knockout Drum (regulated under the IDAPA as a storage tank)

- VES-NCC-116, CPP-659 Mist Collector (regulated under the IDAPA as a storage tank)

The regulated tanks and ancillary equipment specific to the IWTU facility are listed below:

- VES-SRC-131, Waste Feed Tank (regulated under IDAPA as a storage/treatment tank)
- COL-SRC-170 A, B, and C, Product Receiver/Coolers (regulated under IDAPA as storage tanks)
- TK-SRH-196, Firewater Collection Tank (regulated under IDAPA as a storage tank)
- Integrated Waste Treatment Unit (regulated under IDAPA as a miscellaneous treatment unit), which can be divided into the following two subsystems; 1) Sodium Bearing Waste (SBW) Treatment System, which manages the liquid and offgas phases of the process; and 2) Product Transfer and Loadout System, which deals with solids management. The components of each of these subsystems are identified below:
  - SBW Treatment System, includes VES-SRC-140 [Denitration and Mineralization Reformer (DMR)], F-SRC-153 (Process Gas Filter), VES-SRC-160 [Carbon Reduction Reformer (CRR)], COL-SRC-160 (Offgas Cooler), F-SRC-160 (Offgas Filter), BLO-SRH-260 A and B (Offgas Blowers), F-SRH-140 A, B, C, and D~~, and E~~ (Process HEPA Filters), F-SRH-141 A and B (Mercury Adsorbers), and BLO-SRH-240 A and B (Process Exhaust Blowers)
  - Product Transfer and Loadout System, which includes AUG-SRC-440 (DMR Auger/Grinder), AUG-SRC-460 (CRR Auger/Grinder), BLO-SRC-280 (Product Receiver/Cooler Blower), F-SRC-180 (Product Receiver Filter), VES-SRC-180 (Product Receiver Filter Product Pump), F-SRC-185 (Product Handling Vacuum Filter), F-SRC-186 (Product Handling Post Filter), BLO-SRC-286 (Product Handling Vent Blower), and the Canister Filling Stations (3).

The PEWE system, LET&D facility, ~~and~~ ETS, and IWTU are part of an overall liquid waste treatment train at the INTEC. The system is comprised of initial storage and accumulation tanks, followed by storage/transfer, and treatment tanks. The overall ILWMS reduces the volume of waste sent to the Tank Farm Facility (TFF) and treats the TFF waste converting it to a waste form suitable for shipment to an ultimate disposal facility. The nitric acid recovered by the LET&D is returned to the original process, where it reenters the primary stage of the treatment process. The reuse of nitric acid ~~recovered in the LET&D facility~~ is consistent with both the RCRA regulations that encourage reuse, as well as principles of pollution prevention. Rather than continuing to purchase and use "new" nitric acid, the used acid is an effective substitute for commercial product, and ultimately results in less RCRA hazardous waste generation.

Process samples are taken from the CPP-601 Deep Tanks (VES-WG-100, VES-WG-101, VES-WH-100, and VES-WH-101), the CPP-641 Westside Waste Holdup (WWH) Tanks (VES-WL-103, VES-WL-104, and VES-WL-105), ~~and~~ the New Waste Calcining Facility (NWCF) Tanks (VES-NCD-123, VES-NCD-129, VES-NCC-119, VES-NCC-122, VES-NCC-108, VES-NCC-101, VES-NCC-102, or

VES-NCC-103) or F-SRH-141A/B, as necessary, to ensure optimum performance of the units. Process samples may also be taken at VES-WL-106, VES-WL-107, and VES-WL-163. Process samples are analyzed to ensure that the systems operate to minimize corrosion of the vessels and maintain system efficiency. If undesirable concentrations of process parameters are detected, then facility personnel may blend the waste with waste of lesser ionic concentration or add specifically identified commercial chemicals to make the waste more amenable to treatment. In some cases, recovered nitric acid may be added to tank systems to maintain acidity and promote the formation of a ~~passive~~ protective passivation layer ~~against~~ to inhibit corrosion ~~on~~ of the stainless steel.

C-1 CHEMICAL AND PHYSICAL ANALYSES: [IDAPA 58.01.05.012 and 008; 40 CFR §§ 270.14(b)(2) and 264.13(a)]

The INTEC units described in this permit are used to manage a variety of wastes generated from INL activities. Typical waste streams managed by the ILWMS include:

- Liquids generated incidental to conducting debris treatment, decontamination, and descaling activities on INL equipment, piping, and valves
- Concentrated evaporator bottoms
- Rain water and snow melt that infiltrate into sumps and other containment areas
- Water from radioactive fuel storage basins and pools
- Mop water and other cleaning liquids generated incidental to cleanup activities conducted in radiological areas
- Analytical residues, excess samples, and expired analytical standards generated by sampling and analytical laboratory activities
- Solutions from preventative maintenance and corrective maintenance leak tests on process piping and valves
- Newly generated liquid wastes (NGLW) resulting from normal operations and facility deactivation and decommissioning activities
- Aqueous service wastes, such as steam condensate
- ILWMS treatment residuals that may require further processing
- Other waste streams not currently identified that conform to the ILWMS waste acceptance criteria and process tolerance limits identified in Sections C-2(a)(1) and D-8(b)(5), respectively.

Radionuclides that contribute the majority of the activity for wastes managed in the ILWMS include Y-90, Sr-90, Cs-137, Ba-137m, Pu-238, Sm-151, Pu-241, Pm-147, Eu-155, Eu-154, Pu-239, Am-241, Co-60, Ni-63, Cs-134, Sb-125, H-3, Pu-240, Tc-99, Cd-113m, Te-125m, Pa-233, Np-237, Eu-152, Zr-93, Cm-244, Fe-55, Nb-93m, Nb-94, Ru-106, Rh-106, Cs-135, U-234, Ce-144, and Pr-144. The units that comprise the ILWMS are capable of handling high-level, transuranic, and low-level radioactive wastes. Activities of typical wastes range from <20 nCi/g to 50,000 nCi/g. The exposure rates associated with these process solutions routinely exceed 100 mrem/hr and can pose a potentially serious hazard to workers at the INL if appropriate protective measures such as time, distance, and shielding are not applied. As a result the INL is requesting the use of alternate handling and sampling techniques as proposed in this permit.

Before being received into the ILWMS, wastes undergo RCRA characterization in accordance with IDAPA 58.01.05.006 (40 CFR § 262.11). The characterization is based on process knowledge and/or analytical data. Due to the radiological nature of wastes managed in the ILWMS, characterization and the assignment of Environmental Protection Agency (EPA) hazardous waste numbers (HWNs) occur through the use of acceptable knowledge, which involves both process knowledge (PK) and/or chemical/physical testing of the waste. Listed HWNs are applied based on knowledge of the processes. *A Regulatory Analysis and Reassessment of U.S. Environmental Agency Listed Hazardous Waste Numbers for Applicability to the INTEC Liquid Waste System*, INEEL/EXT-98-01213, Rev. 1, February 1999 identifies the listed HWNs associated with the INTEC liquid waste system. Characteristic HWNs may be applied by testing the waste according to the methods set forth in Subpart C of 40 CFR Part 261, or according to an equivalent method approved by the Director of the Idaho Department of Environmental Quality, or by applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.

The RCRA Part A Permit for the PEWE, LET&D ~~systems~~, ~~and~~ ETS, and IWTU lists 28 EPA HWNs. Of the 28 HWNs identified, 5 are listed HWNs and 23 are characteristic HWNs. Units that comprise the ILWMS manage land disposal restricted waste liquids that exhibit the characteristics of corrosivity and toxicity, and contain one or more listed constituents.

Although the feed solutions to the PEWE, LET&D, ~~and~~ ETS, and IWTU do not exhibit the characteristic of ignitability, the EPA HWN D001 is identified on the Part A since small quantities of low total organic carbon (TOC) ignitables may enter the system as a result of laboratory analytical activities. Sampling and analysis has demonstrated that when these small quantities of ignitable waste are aggregated with other wastes in the CPP-601 Deep Tanks to facilitate treatment, the characteristic of ignitability is lost. However, the HWN D001 is tracked through the ILWMS to account for these ignitable materials and any underlying hazardous constituents (UHCs) to ensure proper cradle-to-grave management of mixed and hazardous wastes.

C-1b Waste in Containers: [IDAPA 58.01.05.008; 40 CFR §§ 264.172 and 264.177(a)]

The containerized waste produced and stored in the IWTU Vault Staging Area and Vault Storage Area is a sodium carbonate-based granular solid treatment product. In general, the IWTU treats acidic, aqueous liquid wastes that contain small quantities of organics and heavy metals (exhibit the characteristic of toxicity) and/or contain listed hazardous waste constituents identified on the Part A permit application for this permit. The IWTU stores the treatment product prior to shipment to an ultimate disposal facility. The IWTU removes the organic constituents and mercury during the treatment of the TFF waste. The treatment product exhibits the characteristic of toxicity for metals and retains the listed hazardous waste numbers. The canisters are designed and constructed of materials that are compatible with the sodium carbonate-based granular solid for storage, shipment, and ultimate disposal off-Site. The treatment waste will not be added to unwashed canisters that may have previously contained incompatible waste or material.

C-1~~b~~c Waste in Tank Systems: [IDAPA 58.01.05.008; 40 CFR §§ 264.191(b)(2) and 264.192(a)(2)]

The wastes managed in the ILWMS tank systems described in this permit are all very similar in composition. In general, the ILWMS treats and stores acidic, aqueous liquid wastes that contain small quantities of heavy metals and organics (exhibit the characteristic of toxicity) and/or contain listed hazardous waste constituents identified on the Part A permit application for this permit. These wastes are generated from a variety of INL activities including building and equipment decontamination, laboratory analysis, debris and liquid waste treatment, and research and development. A brief description of each of the tank systems~~ to be permitted~~, and typical wastes managed, is detailed below. Specific characterization information regarding the waste to be treated in the IWTU is presented in Appendix C-1 and Appendix C-2. A more detailed description of each tank system is provided in Attachment 1, Section D, “Process Information,” of this permit.

CPP-601 Deep Tanks (VES-WG-100, VES-WG-101, VES-WH-100 and VES-WH-101)

VES-WG-100, VES-WG-101, VES-WH-100, and VES-WH-101 are collection points for wastes generated from CPP-601 cell floor sumps, process samplers, process equipment drains, decontamination activities, and laboratory analyses conducted in CPP-602 and the Remote Analytical Laboratory (RAL). These aqueous waste streams are normally acidic and may contain small quantities of organics, including low TOC ignitables from laboratory sample preparation and cleaning activities.

CPP-641 Westside Waste Holdup Tanks (VES-WL-103, VES-WL-104, and VES-WL-105)

Historically, VES-WL-103, VES-WL-104, and VES-WL-105 collected aqueous wastes generated from CPP-620, CPP-627, and CPP-637 laboratory research and development and acted as a diversion point for service waste such as steam condensate. VES-WL-103, VES-WL-104, and VES-WL-105 are now collection points for CPP-601 East Vent Tunnel sumps, CPP-666, and CPP-684. These aqueous waste streams are normally acidic and may contain small quantities of organics, including low TOC ignitables from laboratory sample preparation and cleaning activities.

New Waste Calcining Facility (NWCF) Tanks (VES-NCD-123, VES-NCD-129, VES-NCC-119, and VES-NCC-122)

VES-NCD-123, the Decon Holdup Tank, and VES-NCD-129, the Decon Collection Tank, are located in CPP-659 and support decontamination facility activities. These tanks primarily collect acidic, aqueous decontamination solutions from debris treatment, including high efficiency particulate air (HEPA) filter leaching activities, and equipment decontamination. These tanks are described in detail in the Hazardous Waste Management Act (HWMA)/RCRA Storage and Treatment Permit for the INTEC, Volume 18, October 2001.

Tanks VES-NCC-119, the Fluoride Hot Sump Tank, and VES-NCC-122, the Non-Fluoride Hot Sump Tank, are also located in CPP-659 and support operation of the Evaporator Tank System (ETS) as well as NWCF decontamination activities. During operation of the ETS, evaporator bottoms are routed to VES-NCC-119. Condensed evaporator overheads are collected in VES-NCC-122. These tanks also receive acidic, aqueous liquid decontamination solutions generated in the NWCF as a result of equipment repair or preventive maintenance. Wastes collected in VES-NCC-119 are usually transferred to the TFF. If the fluoride concentration is determined to be below the corrosive limit, or can be blended with other wastes to conform to tolerance limits, or can be complexed to alleviate corrosion concerns, then the solution may be transferred to the PEWE system. Wastes collected in VES-NCC-122 are typically sent to the PEWE for volume reduction.

Process Waste Liquid (PWL) System (VES-WL-135, VES-WL-136, VES-WL-137, VES-WL-138, VES-WL-139, VES-WL-142, VES-WL-144, and VES-WL-150)

The PWL tanks are located in CPP-604, CPP-649, and associated valve boxes. The PWL system receives condensate from the Atmospheric Protection System (APS) and the Main Stack Sump as well as waste solutions from CPP-604/-605 floor sumps or drains, and sampler drains. These aqueous solutions are typically generated on an irregular basis and are transferred directly to the PEWE Feed Sediment/Feed Tanks, VES-WL-132 or VES-WL-133.

Sumps SU-WL-140, -143, -145, -146, -147 and -148 do not contain tanks. These sumps are not used routinely. The exclusive purpose of these sumps is to contain liquids during immediate responses to discharges of hazardous wastes.

Sump SU-WL-140 is located in the South Cell of the Rare Gas Plant (RGP). The RGP is no longer active. Therefore, there are no sources of waste that would be collected in this sump.

Sump SU-WL-143 is located in the RGP Pump Pit. Since the RGP is no longer active, there are no sources of waste that would be collected in this sump.

Sump SU-WL-148 is located at the INTEC main stack. In the event of equipment failure, condensate from the main stack could collect in this sump.

Sumps SU-WL-145 and SU-WL-146 are part of the secondary containment and leak detection system in the PEWE Condensate Collection Cell.

Sump SU-WL-147 is part of the secondary containment and leak detection system in the PEWE EVAP-WL-161 Cell.

CPP-604 Tank Farm Tanks (VES-WM-100, VES-WM-101, and VES-WM-102)

VES-WM-100, VES-WM-101, and VES-WM-102 typically provide storage capacity for PEWE bottoms. If necessary, these tanks can also be used to store PEWE feed solutions by routing liquids through valve box C-40.

Evaporator Feed Sediment Tank (VES-WL-132)

VES-WL-132 may receive waste from the tank systems previously described in this section as inputs to the ILWMS. In addition, VES-WL-132 may receive snow melt or other liquids from TFF sumps, basin water from CPP-666, or waste from other INL facilities via the truck unloading bay at CPP-1619.

VES-WL-132 functions as a settling basin for solids that would otherwise settle out in the Evaporator Feed Collection Tank, VES-WL-133. When the feed stream enters VES-WL-132, it encounters a baffle-and-weir system. The solids settle out of the solution as it flows under the baffle and over the weir. Since the cessation of fuel processing activities in the early 1990's, solids are no longer considered a problem in the feed solutions. However, in the unlikely event that VES-WL-132 was to completely fill, solids would be carried over into VES-WL-133. As VES-WL-132 approached its capacity, solids would be detected as a result of plugging in the vessel's instrument lines. VES-WL-132 would then be immediately bypassed, diverting feed solutions directly to VES-WL-133. Once full of solids, VES-WL-132 is designed to be remotely removed/replaced. The full sediment tank will be managed as a RCRA solid waste and disposed in accordance with all applicable regulations. However, if the solids content in PEWE feed remains low, the INL may elect not to install a new feed sediment tank.

Evaporator Feed Collection Tank (VES-WL-133)

VES-WL-133 receives waste from all the sources previously identified in this section as inputs to the ILWMS. Waste from several of these inputs may be blended to promote optimum operability of the unit. VES-WL-133 serves both evaporators, EVAP-WL-129 and EVAP-WL-161. Wastes are transferred from VES-WL-133 to either the Evaporator Head Tank, VES-WL-109, or directly to EVAP-WL-129.

Surge Tank for VES-WL-133 (VES-WL-102)

The current function of this tank is to provide surge capacity for VES-WL-133.

Evaporator Head Tank (VES-WL-109)

VES-WL-109 provides a constant head for feed solution to evaporator EVAP-WL-161. Feed is pumped to this tank from the Evaporator Feed Collection Tanks, VES-WL-133 or VES-WL-102. VES-WL-109 has an overflow that returns to either VES-WL-133 or VES-WL-102.

Process Condensate Surge Tank (VES-WL-134)

VES-WL-134 collects acidic condensate from evaporator EVAP-WL-129 overheads. VES-WL-134 provides the capability for the evaporators to be operated in series. For series operation, EVAP-WL-129 is operated until VES-WL-134 is full. This tank then provides feed for EVAP-WL-161.

VES-WL-134 may also be used to store concentrated acidic LET&D bottoms for reuse in other INTEC operations.

Process Condensate Surge Tank (VES-WL-131)

VES-WL-131 collects acidic condensate from evaporator EVAP-WL-129 and/or EVAP-WL-161 overheads. When full, the contents of this tank are transferred to one of the Process Condensate Collection Tanks, VES-WL-106, VES-WL-107, or VES-WL-163.

Process Condensate Collection Tanks (VES-WL-106, VES-WL-107, and VES-WL-163)

VES-WL-106, VES-WL-107, and VES-WL-163 store acidic condensate from Process Condensate Surge Tank, VES-WL-131. This aqueous condensate may be either re-fed to the PEWE or transferred to the LET&D facility for recovery of nitric acid.

Bottoms Collection Tanks (VES-WL-101 and VES-WL-111)

VES-WL-101 and VES-WL-111 primarily collect concentrated acidic PEWE evaporator bottoms from EVAP-WL-129 and EVAP-WL-161. Valve box C-40 allows transfers between these tanks and other facilities including the TFF, ETS, and CPP-659.

Process Condensate Knock Out Pot (VES-WL-108)

The function of the Process Condensate Knock-Out Pot is to remove entrained acidic condensate remaining in the vessel offgas (VOG) for the PEWE process condensate collection and surge tanks. From this point, PEWE condensate VOG passes to the plant VOG system. Any liquid removed drains back to VES-WL-131 or VES-WL-133.

Acid Fractionator Waste Feed Head Tank (VES-WLK-197)

VES-WLK-197 receives PEWE acidic condensate from the CPP-604 Process Condensate Collection Tanks, VES-WL-106, VES-WL-107, and VES-WL-163. This vessel acts as the feed tank to LET&D fractionators, FRAC-WLL-170 and FRAC-WLK-171.

Acid Fractionator Bottoms Tank (VES-WLL-195)

VES-WLL-195 collects concentrated acidic LET&D bottoms from fractionators FRAC-WLL-170 and FRAC-WLK-171. These bottoms are primarily comprised of concentrated nitric acid (10-13 molar) solution.

Nitric Acid Recycle Tank (VES-NCR-171)

VES-NCR-171 stores the concentrated nitric acid recovered by the LET&D facility. This acid may be used elsewhere at the INTEC for decontamination or waste treatment.

Nitric Acid Recycle Head Tank (VES-NCR-173)

VES-NCR-173 acts as a constant head feed tank for transfers of LET&D recovered nitric acid to other INTEC processes. Concentrated nitric acid is airlifted from the Nitric Acid Recycle Tank, VES-NCR-171, to VES-NCR-173 for this purpose.

Blend Tank (VES-NCC-101)

VES-NCC-101 receives waste from VES-NCC-102, VES-NCC-103, VES-NCC-119, VES-NCC-122, VES-NCD-123, VES-NCD-129, PEWE, and the TFF and acts as the feed tank for the ETS. Feed for the IWTU is also stored in this tank prior to transfer to VES-NCC-102 or VES-NCC-103. Chemical adjustments to the feed can be accomplished here.

Hold Tank (VES-NCC-102)

VES-NCC-102 receives waste from VES-NCC-101, VES-NCC-103, VES-NCC-119, VES-NCC-122, VES-NCD-123, VES-NCD -129, PEWE, and the TFF. This tank also provides feed surge capacity for the ETS. Feed for the IWTU is also transferred through this tank. Chemical adjustments to the feed can be accomplished here.

Hold Tank (VES-NCC-103)

VES-NCC-103 receives waste from VES-NCC-101, VES-NCC-102, VES-NCC-119, VES-NCC-122, VES-NCD-123, VES-NCD-129, PEWE, and the TFF. This tank also provides feed surge capacity for the ETS. Feed for the IWTU is also transferred through this tank. Chemical adjustments to the feed can be accomplished here.

Scrub Hold Tank (VES-NCC-108)

VES-NCC-108 collects the condensate from the Vent Condenser Knockout Drum, VES-NCC-136.

Vent Condenser Knockout Drum (VES-NCC-136)

The function of VES-NCC-136 is to remove entrained condensate remaining in the offgas. Any liquid removed drains to VES-NCC-108.

Mist Collector (VES-NCC-116)

The function of VES-NCC-116 is to remove entrained condensate remaining in the offgas. Any liquid removed drains to VES-NCC-119.

Constant Head Feed Tank (VES-NCC-152)

VES-NCC-152 provides a constant head for feed solution to evaporator VES-NCC-150. Feed is airlifted to this tank from the Blend Tank, VES-NCC-101.

Waste Feed Tank (VES-SRC-131)

VES-SRC-131 provides feed solution to the DMR (VES-SRC-140). Feed is transferred to VES-NCC-101, VES-NCC-102 and VES-NCC-103 and then to the Waste Feed Tank.

Product Receiver/Cooler (COL-SRC-170A/B/C)

COL-SRC-170A/B/C receives solid treatment product from the DMR and CRR, and fines collected in the Process Filter, Offgas Filter, product handling filters, and Product Receiver Filter Product Pump, where they are cooled prior to being transferred to storage/shipping canisters.

Fire Water Collection Tank (TK-SRH-196)

TK-SRH-196 is provided to collect fire water resulting from a fire in the IWTU Building Ventilation HEPA Filters, Process HEPA Filters, or Mercury Adsorbers. Any fire water collected in this tank will be analyzed and transferred to suitable containment for treatment or disposal

C-1g Waste in Miscellaneous Treatment Units: [IDAPA 58.01.05.0~~08~~12; 40 CFR § ~~264.601(a)(1)~~270.23]

The miscellaneous treatment units covered by this Part B permit include the PEW evaporators, EVAP-WL-129 and EVAP-WL-161, the LET&D facility fractionators, FRAC-WLL-170 and FRAC-WLK-171, ~~and~~ the ETS, EVAP-NCC-150, IWTU steam reformers, VES-SRC-140 and VES-SRC-160, and associated ancillary equipment including the Product Transfer Loadout System.

As noted previously in Section C-1b, the ILWMS is part of an overall liquid waste treatment train. Aqueous liquids generated from INL decontamination, waste treatment, and other activities are processed in the PEWE and ETS to reduce the volume of mixed waste sent to the TFF for storage. The LET&D facility further reduces this volume by recovering approximately 99% of the nitric acid contained in condensed PEWE overheads. This nitric acid is then used elsewhere on-Site for treatment and decontamination activities in lieu of purchasing commercial grade nitric acid, effectively minimizing the quantity of waste generated from INL activities. The final component(s) of the ILWMS treatment train ~~will be~~ is the IWTU~~identified in the preferred treatment alternative selected by the DOE~~. PEWE and ETS bottoms ~~will be~~ currently stored in the TFF, and NGLW~~, or other compliant storage unit, until~~ will be treated by the IWTU ~~this ultimate treatment and disposal alternative has been identified, permitted, and constructed~~. A brief description of each of the miscellaneous treatment units ~~to be permitted~~ and typical wastes managed are detailed below. A more detailed description of each miscellaneous treatment unit is provided in Attachment 1, Section D, "Process Information," of this permit.

Process Equipment Waste Evaporator Unit (EVAP-WL-129, includes VES-WL-129, VES-WL-130, HE-WL-307 and HE-WL-308)

The function of EVAP-WL-129 is to reduce the volume of waste sent to the TFF. The evaporator is composed of a flash column, VES-WL-129, a mist eliminator, VES-WL-130, a reboiler, HE-WL-307, and a condenser, HE-WL-308. Feed pumps draw waste from the Evaporator Feed Collection Tank, VES-WL-133, and transfer the waste to the evaporator. The evaporator uses steam to heat the feed in a reboiler. This feed is circulated from the reboiler through the flash column, where vapor is separated from the liquid. Liquid drops to the bottom of the flash column and is recycled back to the reboiler. Constituents of the feed that have a lower boiling point than the system temperature produce a vapor. Any constituents with a higher boiling point remain in the liquid and are recirculated through the evaporator.

The vapor phase rises in the flash column, encounters a baffle, and then passes through a coarse wire mesh to remove entrained liquid droplets from the vapor. The vapor continues through the mist eliminator, which contains a fine wire mesh to remove additional entrained liquid droplets (light constituents and water). Finally, the vapor flows through a condenser where acidic vapor is condensed and collected in VES-WL-131. Any non-condensable vapor is routed to the plant VOG system.

Process Equipment Waste Evaporator Unit (EVAP-WL-161, includes VES-WL-161, VES-WL-162, HE-WL-300 and HE-WL-301)

EVAP-WL-161 is similar to EVAP-WL-129 in both design and operation. One minor difference is that EVAP-WL-161 is gravity fed from an Evaporator Head Tank, VES-WL-109, rather than receiving waste directly from feed pumps. Evaporator EVAP-WL-161 is composed of a flash column, VES-WL-161, a separator, VES-WL-162, a reboiler, HE-WL-300, and a condenser, HE-WL-301. The operation of this evaporator is virtually identical to that described above for EVAP-WL-129.

LET&D Acid Fractionator (FRAC-WLL-170, includes HE-WLL-398, HE-WLL-396, and VES-WLL-198)

The LET&D treatment process reduces the volume of liquid waste by fractionating condensed acidic PEW evaporator overheads into saturated steam/offgas and acid. The fractionators separate the waste solution into water (overheads) and nitric acid (bottoms). Fractionator FRAC-WLL-170 includes a reboiler, HE-WLL-398, a condenser, HE-WLL-396, and a liquid separator, VES-WLL-198. The feed is heated to its boiling point by introducing steam to the reboiler. The vapor from the boiling liquid rises through several stacked sieve trays (perforated plates) in FRAC-WLL-170. The sieve trays installed in the fractionator column mix the vapors and liquid. As the descending liquid contacts the rising vapor on each tray, nitric acid condenses and remains in solution. Due to its higher boiling point, the nitric acid collects in the bottom of the fractionator, while water, with a lower boiling point, is discharged as steam.

The saturated steam offgas generated from the fractionation process is drawn through the condenser, where it is partially condensed, producing a reflux stream and steam offgas. This mixture then flows through a liquid separator where the reflux is removed and returned to the top of the acid fractionator. The reflux flows downward, providing liquid for the upper trays. The remaining steam flows through the separator, passes through a superheater and HEPA filters, and is exhausted to the atmosphere via the INTEC Main Stack.

LET&D Acid Fractionator (FRAC-WLK-171, includes HE-WLK-399, HE-WLK-397, and VES-WLK-199)

Fractionator FRAC-WLK-171 is identical in design and operation to FRAC-WLL-170. FRAC-WLK-171 includes a reboiler, HE-WLK-399, a condenser, HE-WLK-397, and a liquid separator, VES-WLK-199.

Evaporator Tank System Unit (VES-NCC-150, HE-NCC-350, and HE-NCC-351)

The function of the ETS is to reduce the volume of waste sent to and stored in the TFF. The evaporator is composed of a flash column, VES-NCC-150, a reboiler, HE-NCC-350, and a condenser, HE-NCC-351. An airlift transfers waste from the Blend Tank VES-NCC-101 to VES-NCC-152 and is gravity fed to the evaporator, VES-NCC-150. Steam is used to heat the feed in a reboiler. This feed is circulated from the reboiler through the flash column, where vapor is separated from the liquid. The vapor phase rises in the flash column and encounters a cyclone that separates the liquid from the vapor. The liquid drops to the bottom of the flash column and is recycled back to the reboiler. From the cyclone, the vapor and remaining entrained droplets flow through a demister that de-entrains the liquid droplets. The resulting overhead vapor flows into the condenser, HE-NCC-351. The condensate is collected in VES-NCC-122. Any non-condensable vapor is routed to the process offgas system and then to the APS. When conditions warrant, the bottoms are transferred to VES-NCC-119.

Constituents of the feed that have a boiling point equal to or lower than the system temperature produce a vapor. Any constituents with a higher boiling point remain in the liquid and are recycled through the evaporator.

Integrated Waste Treatment Unit

The purpose of the IWTU is to process SBW currently located in the TFF, as well as NGLW.

The SBW contained in TFF tanks VES-WM-187, -188, and -189 is transferred to the NWCF Blend and Hold Tanks VES-NCC-101, -102, and -103 where the waste is sampled and/or blended, as necessary, prior to being pumped to the Waste Feed Tank, VES-SRC-131.

From the Waste Feed Tank the waste is pumped to the first of two fluidized bed steam reformers, the DMR, VES-SRC-140. The waste is atomized with a controlled flow of compressed nitrogen and instrument air in the feed injectors and then sprayed into the DMR's heated fluidized bed. Coal is added to the bed to maintain temperature and promote a reducing environment to convert nitrogen oxides to nitrogen gas. The liquid waste is immediately vaporized and the solids from the liquid waste are deposited on the bed particles causing the particles to gradually increase in size over time. The bed media, or treatment product, is drawn off the bottom of the DMR using an auger/grinder system and then pneumatically transported to the Product Receiver/Coolers, COL-SRC-170A/B/C. This sodium carbonate-based granular solid treatment product is expected to be classified as remote-handled (RH) transuranic (TRU) mixed waste.

The process gas from the DMR is filtered by the Process Gas Filter, F-SRC-153, and then sent to the second steam reformer, the CRR, VES-SRC-160. The process gasses from the DMR are introduced into the lower part of the CRR, into the heated fluidized bed. In the CRR the offgas is mixed with carbon, oxygen enriched air, nitrogen, and water, as necessary for temperature control. The bed particles in the CRR are not expected to increase significantly in size since the input feed is DMR offgas. Therefore, routine bed removal through the auger/grinder located on the bottom of the vessel is used sparingly. The offgas continues through the Offgas Cooler, COL-SRC-160, which cools the offgas vapor with an atomized water spray. The offgas then passes through the Offgas Filter, F-SRC-160. Next the offgas is routed through the Process HEPA filters, F-SRH-140A/B/C/D, and the Mercury Adsorbers, F-SRH-141A/B, which are filled with sulfur-impregnated granular activated carbon (GAC). Finally, the offgas stream passes through a Continuous Emissions Monitoring System before being combined with HEPA-filtered building ventilation air and exiting the system through a dedicated stack.

Waste treatment product drained from reformers and elutriated fines collected in offgas cleanup equipment are sent to one of three Product Receiver/Coolers, COL-SRC-170A/B/C. The treatment product is cooled via a nitrogen cooling loop and eventually drained from the Product Receiver/Coolers, in a batch mode, into canisters that are positioned one at a time for filling at one of three Canister Filling Stations.

The full canisters are placed in portable concrete storage vaults in a 4 X 4 pattern for a total of 16 canisters to a storage vault. The storage vault is transported to the Vault Storage Area using mechanical means such as fork lifts or air jacks.

When transport trucks and casks are made available from the ultimate disposal facility, the storage vaults are retrieved from storage and located in the Vault Staging Area, adjacent to a truck bay equipped with air locks. Canisters will be loaded into the appropriate cask on the truck and transported to the disposal facility.

A more detailed description of ILWMS tank systems and miscellaneous treatment units is provided in Attachment 1, Section D of this Part B permit.

C-2 WASTE ANALYSIS PLAN: [IDAPA 58.01.05.008 and 012; 40 CFR §§ 264.13(b) and (c), and 270.14(b)(3)]

The regulations under RCRA, as implemented through IDAPA 58.01.05.008 (40 CFR § 264.13), require a waste analysis plan (WAP) for regulated waste management units. This WAP identifies what waste characterization information is needed, the nature and extent of information required, the method(s) by which the information is gathered, and the quality assurance/quality control (QA/QC) goals.

The process outlined in this WAP is implemented for characterization of all mixed/hazardous wastes or potentially hazardous wastes managed at the INTEC units described herein. Wastes subject to this plan include wastes generated from INL operations, treatment residues generated from INL RCRA-regulated waste management activities, and off-Site wastes that have been verified in accordance with the WAP requirements of IDAPA 58.01.05.008 [40 CFR § 264.13(c)]. As such, this WAP is intended for inclusion in day-to-day waste management operations.

This WAP is established to ensure that all data used for waste characterization is scientifically valid, defensible, and of known precision and accuracy. This objective relies on the identification of appropriate parameters and rationale, analytical methods, sampling methodologies, and quality control.

The objectives of this WAP are as follows:

- Ensure that sufficient information is available to provide safe handling, storage, and treatment of waste materials

- Define the parameters for characterization and the rationale for selection
- Establish consistent sampling, sample management, analytical methods, parameter selection, and controls for wastes received and generated
- Provide a description of the waste stream characterization and approval process from the point of waste generation through final disposition of the waste
- Establish unit-specific waste acceptance criteria (where necessary) for treatment units to ensure that sufficient information is available to determine whether the wastes considered for storage at the respective units meet the requirements established in this permit
- Provide additional requirements for the characterization and acceptance of ignitable wastes
- Define Land Disposal Restriction (LDR) requirements applicable to wastes managed in the miscellaneous treatment, and storage units
- Verify that EPA HWNs for wastes stored or treated are acceptable per the EPA HWNs listed in the Part A.

This WAP will be revised whenever test methods are changed or whenever regulations change that affect the WAP.

C-2a Parameters and Rationale: [IDAPA 58.01.05.008; 40 CFR §§ 264.13(b)(1) and (2)]

Tables C-1 and C-2 outline the parameters for analysis and corresponding rationale that are employed to perform hazardous waste determinations in accordance with IDAPA 58.01.05.006 (40 CFR § 262.11) and to assess LDR requirements. The parameters and rationale presented in these tables are selected to ensure compliance with RCRA and unit-specific waste acceptance requirements and to guarantee safe, compliant treatment and storage. Not all of the parameters identified in Tables C-1 and C-2 are selected for each waste stream. Only the specific parameters applicable to each waste stream proposed for storage or treatment in the ILWMS are evaluated.

Table C-1. Test Methods for Waste Analysis Parameters and Rationale

PARAMETER	TEST METHOD(S)[a]	RATIONALE
Toxicity characteristic	1311 Toxicity Characteristic Leaching Procedure (TCLP) or process knowledge	Determine the waste and LDR status.
Metals: antimony arsenic barium beryllium cadmium chromium lead mercury nickel selenium silver thallium	3005, 3010, 3050, 3051, 3052, 6010, 7470, 7471 or process knowledge	Determine if the waste is characteristically hazardous for toxicity. Determine reasonably expected underlying hazardous constituents (UHCs).
Volatile and semi-volatile organic compounds	5030, 5035, 8015, 8082, 8260, 3510, 3550, 3600, 8270 or process knowledge	Determine whether the waste is characteristically toxic for organic compounds or whether listed waste constituents can be detected. Identify reasonably expected UHCs. Determine the concentration of organic constituents detected.
Flash point	1010, 1020, ASTM D93, D3828 or process knowledge	Determine if waste is characteristically ignitable.
Corrosivity/Acidity, pH or Corrosivity toward steel	ACMM 7012[b], 9040, 9045C, 9041 or process knowledge	Determine if the waste is characteristically corrosive.

Table C-1. Test Methods for Waste Analysis Parameters and Rationale (continued)

PARAMETER	TEST METHOD(S)[a]	RATIONALE
Reactivity (cyanides, sulfides, water reactive, chemical stability, shock sensitive)	C003[c], 9010, 9013, 9014, 9030, 9031, 9034, or process knowledge	Determine if waste is characteristically reactive and prevent mixing of incompatible wastes in tank and treatment systems.
Free liquids	9095 Paint Filter Liquids Test, visual inspection or process knowledge	Determine whether the waste is a solid or a liquid.
Total organic carbon (TOC)	9060 or process knowledge	Determine whether organics may be present in measurable quantities.

ASTM = American Society for Testing and Materials
ACMM = Analytical Chemistry Methods Manual

a. Methods are from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, unless otherwise stated.
b. G. L. Booman, M. C. Elliot, R. B. Kimball, F. O. Cartan, J. E. Rein, “Determination of Free Acid in the Presence of Hydrolyzable Ions,” Analytical Chemistry, 30 No. 2 (February 1958), pp. 284-287.
c. Arthur D. Little, Inc., Sampling and Analysis Methods for Hazardous Waste Combustion, EPA-600/8-84-002, NTIS No. PN84-1555845, February 1984.

Table C-2. Test Methods, Parameters, and Rationale for LDR Status

PARAMETER	TEST METHOD(S)[a]	RATIONALE
Toxicity characteristic	1311 Toxicity Characteristic Leaching Procedure (TCLP) or process knowledge	Determine waste and LDR status for toxicity.
Metals: antimony arsenic barium beryllium cadmium chromium lead mercury nickel selenium silver thallium	3005, 3010, 3050, 3051, 3052, 6010, 7470, 7471 or process knowledge	Determine LDR status for toxicity. Evaluate mercury subcategory and UHCs.
Volatile and semi-volatile organic compounds	5030, 5035, 8015, 8082, 8260, 3510, 3550, 3600, 8270 or process knowledge	Determine listed waste and LDR status for toxicity. Evaluate UHCs.
Flash point	1010, 1020, ASTM D93, D3828 or process knowledge	Determine LDR status for ignitability.
Corrosivity/Acidity, pH or Corrosivity toward steel	ACMM 7012[b], 9040, 9045, 9041 or process knowledge	Determine LDR status for corrosivity.

Table C-2. Test Methods, Parameters, and Rationale for LDR Status (continued)

PARAMETER	TEST METHOD(S)[a]	RATIONALE
Reactivity (cyanides, sulfides, water reactive, chemical stability, shock sensitive)	C003[c], 9010, 9013, 9014, 9030, 9031, 9034, or process knowledge	Determine LDR status for reactivity and subcategory.
Total organic carbon (TOC)	9060 or process knowledge	Determine wastewater or nonwastewater category
Total suspended solids (TSS)	160.1[d] or process knowledge	Determine wastewater or nonwastewater category

ASTM = American Society for Testing and Materials
ACMM = Analytical Chemistry Methods Manual

a. Methods are from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, unless otherwise stated.
b. G. L. Booman, M. C. Elliot, R. B. Kimball, F. O. Cartan, J. E. Rein, “Determination of Free Acid in the Presence of Hydrolyzable Ions,” Analytical Chemistry, 30 No. 2 (February 1958), pp. 284-287.
c. Arthur D. Little, Inc., Sampling and Analysis Methods for Hazardous Waste Combustion, EPA-600/8-84-002, NTIS No. PN84-1555845, February 1984.
d. *Methods for Chemical Analysis for Water and Wastes*, EPA-600/4-79-020.

Wastes are characterized and LDR requirements are determined at the point of generation by facility personnel with assistance from other contractor organizations, as needed, by analyzing the waste or by applying process knowledge. The following are examples of process knowledge:

- Raw materials used – knowledge of the type, quantity, and concentration of raw materials used in the system combined with detailed knowledge of the generating process may provide enough information to adequately characterize the waste.
- Process description – pertinent details of the process generating the waste and the chemicals used in the process must be described. The more complex the process, the more information would be required.
- Chemical/material composition specifications – chemical specifications may be available from the purchase specifications of a particular chemical, from product information provided by the manufacturer, or from the labels for the particular chemical in question. For pure chemicals whose contents and characteristics are well known (e.g., nitric acid), standard chemical reference materials may supply the required information. Standard material composition reference tables may supply the required information for metals,

plastics, and other materials manufactured to certain grades, alloy specifications, etc., whose material contents and characteristics are well known (e.g., Type 304 stainless steel).

- Material Safety Data Sheets (MSDSs) – chemical specifications and related information are available on these standard reference materials. MSDSs may be provided by the manufacturer or acquired through available MSDS databases.

- Process reference materials including laboratory notebooks, strip charts, correspondence, chemical analyses, and analytical reports.

- Analytical reports from non-SW-846 chemical analyses or information from similar processes.

If process knowledge is adequate to ensure that a particular constituent is not present in the waste, then analysis for that constituent will not be performed. For instance, if the waste comes from a well-defined aqueous process, and no organic chemicals are associated with that process, then analysis for volatile or semi-volatile organics will not be conducted. Similarly, if there is no reason to suspect pesticides or herbicides, analysis for those substances will not be conducted. If process knowledge is not sufficient to eliminate a particular parameter, then that parameter will undergo selection for testing.

Specific parameters selected for RCRA characterization analysis are determined on a case-by-case basis. Facility personnel select the appropriate parameters based on knowledge of the waste source, unit-specific waste acceptance criteria, and characterization requirements to identify RCRA-regulated wastes. This ensures that the appropriate parameter selection will be matched with the correct analytical method(s) to generate the data required for subsequent management of the waste within the ILWMS.

All process knowledge determinations and RCRA characterization analytical results are documented in the facility operating record.

~~Since the PEWE, LET&D systems, and ETS are segments of an overall treatment train,~~ LDR requirements identified at the point of generation are carried through the entire ILWMS. Compliance with the required treatment standards specified in IDAPA 58.01.05.011 (40 CFR § 268) ~~will be~~ is evaluated following treatment in the ~~treatment alternative selected by the DOE~~ IWTU. Required LDR notifications ~~will be~~ are prepared prior to shipment of any treatment residuals for final disposal.

C-2a(1) Waste Acceptance Criteria

Any wastes accepted at the waste management units addressed in this permit must meet the WAC as defined below. Prior to being accepted at these units, a Waste ~~Disposition~~ Generator Services (~~WDS~~WGS) Facility Representative (FR), with assistance from an assigned ~~WDS~~ WGS Waste Technical Specialist (WTS), evaluates each waste to ensure the WAC have been met. The waste acceptance process is described in detail in Section C-2a(2) of this WAP. The WAC are dependent on the waste form, EPA HWNs specified on the Part A, method of characterization, waste characteristics, and packaging. Waste generators or INTEC point-of-generation personnel, in cooperation with ~~WDS~~ WGS, are responsible for performing necessary characterization in accordance with the methods specified in this section (See Tables C-1 and C-2).

The following wastes are prohibited from the waste management units addressed in this permit:

- Wastes designated with EPA HWNs not identified on the Part A permit application for the specified receiving treatment and/or storage unit
- Incompatible wastes within the same tank system or wastes not compatible with the tank system in which they are stored
- Wastes with no free liquids(except for the IWTU Vault Staging and Vault Storage Areas)
- Wastes with high solids content that cannot be separated from the liquid portion (PEWE, LET&D, and ETS only)
- Foaming agents
- Polymerizing materials in sufficient concentration to preclude effective blending
- High TOC subcategory ignitables (EPA HWN D001 with ≥ 10% total organic carbon)
- Waste containing mercury ≥ 3,000 ppm in solution (for the ETS and IWTU)
- Waste containing mercury ≥ 260 ppm (for the PEWE and LET&D)
- Ethylene
- Glycerol
- Mineral Oil
- Sodium Glycerite
- Stoddard Solvent

- Unstable, shock-sensitive, and Department of Transportation (DOT)-defined pyrophoric materials
- Unknown wastes
- Wastes containing DOT Class 1 explosives or Class 4 Division 4.1 flammable solids meeting the definition of a wetted explosive, as identified in 49 CFR 173 Subpart C
- Active pathogens, infectious, or etiologic agents
- Wastes that do not comply with the 40 CFR 268.3 dilution prohibition
- Wastes that generate liquid treatment residuals possessing constituents that do not comply with the WAC of downstream treatment, storage, or disposal units (e.g., the LET&D facility). This assessment is performed on a case-by-case basis.

C-2a(2) Waste Acceptance Process

When an activity is expected to generate a new waste, or upon the generation of a waste, a ~~WDS~~ WGS FR is contacted for guidance and a Waste Determination and Disposition Form (WDDF) is completed if the waste stream does not match an existing profile. The WDDF provides the preacceptance certification needed prior to accepting on-Site wastes.

The first two parts of the WDDF are prepared by the generator with assistance from ~~WDS~~ WGS and other organizations, as necessary, to document the characteristics, pertinent details, and probable waste type of the proposed waste based on process knowledge from the generator. The first two parts of the WDDF include:

Section I: Process Knowledge Evaluation - This section includes information provided by the generator based on their knowledge of the processes and materials involved in generating the waste. Process knowledge is used in addition to or in place of sampling and analysis to determine if a waste is RCRA hazardous and to classify it in order to meet treatment, storage, and disposal requirements. If the waste is clearly not a RCRA-regulated hazardous waste, it is managed in accordance with its properties (e.g., low-level, industrial, etc.).

Section II: Probable Waste Type - This section is used to make a preliminary determination of the waste type and probable waste codes that apply based on an evaluation of the information provided by the generator in Section I.

The third part of the WDDF is completed by the WTS to finalize the planned waste determination and disposition of the proposed waste. This part of the WDDF includes:

> Section III: Waste Determination and Disposition - This section is completed by determining the regulatory and procedural requirements of the waste stream from information included in the first two sections.

The WDDF is a dynamic document that is subject to revision. As a best management practice, an annual review and recertification is required for all active waste streams. The generator is also required to notify ~~WDS~~ WGS of any process changes. ~~WDS~~ WGS evaluates the changes with the generator to determine potential effects on the waste characterization. If it is determined that the characterization of a given waste stream changes, the WDDF is revised to reflect the change. An example of a typical WDDF is included as Appendix C-~~1~~3.

Exhibit C-1 presents a flow diagram of the waste acceptance process for on-Site waste. An initial process knowledge evaluation of the waste stream is conducted to determine if the waste is from a recurring stream with an approved waste profile on file. If the stream has an approved profile on file, the process and waste are evaluated to ensure the waste is consistent with the approved profile. All approved waste stream profiles are reevaluated in accordance with Section C-2d, “Frequency of Analysis,” of the waste acceptance process.

If the waste is determined to be RCRA-regulated, based on the initial data obtained from the hazardous waste determination, the WTS performs an LDR evaluation and then evaluates the TSDF options available. Once an appropriate TSDF is identified, the WTS arranges for additional waste characterization, as needed, for acceptance to the TSDF. Waste characterization data and supporting documentation are maintained and made available for both generators and TSDFs.

If the waste stream does not meet the acceptance criteria for the intended unit(s), another TSDF is identified (either on- or off-Site) that can compliantly accept the waste. Compliance with “acceptance criteria” implies compliance with the requirements of the unit-specific Part A permit application, Attachment 1, Section D, and adherence to the list of prohibited items in Attachment 2, Section C-2a(1).

Exhibit C-1. Waste Acceptance Flow Diagram for On-Site Waste.

When submittal of a new WDDF is required, in accordance with Section C-2d, "Frequency of Analysis," a new waste acceptance evaluation is conducted. Recertification of existing waste streams requires written and signed documentation from the generator stating that the waste stream and corresponding WDDF remain the same as presently approved by the WTS. Recertification also requires that there have been no significant changes in the process generating the waste, the physical and chemical properties of the waste, or the LDR status of the waste per IDAPA regulations. Recertification of waste streams for the ILWMS is conducted annually.

Liquid wastes to be received at the waste management units addressed in this permit may be received from other INL locations. In these instances, the wastes will normally be unloaded in the CPP-1619 truck unloading station and transferred to the PEWE system. The same characterization and waste acceptance methodology will be applied for wastes received into the ILWMS, regardless of the point of generation.

Wastes transferred within the INTEC perimeter are not subject to DOT shipping requirements. However, shipping and receipt of waste from outside the INTEC are subject to DOT shipping requirements.

LDR Requirements

Point-of-generation facility personnel provide waste characterization information and use this information to complete LDR notifications, per IDAPA 58.01.05.011 (40 CFR § 268.7). In cases where facility personnel determine that an LDR waste does not meet the applicable treatment standard(s) set forth in IDAPA 58.01.05.011 (40 CFR § 268, Subpart D), or exceeds the applicable prohibition level(s) set forth in IDAPA 58.01.05.011 (40 CFR § 268.32) or Section 3004(d) of RCRA, facility personnel provide written notice in accordance with IDAPA 58.01.05.011 (40 CFR § 268.7).

In cases where facility personnel determine that a restricted waste is being managed that can be land-disposed without further treatment, facility personnel submit written notice stating that the waste meets (or is exempt from) applicable treatment standards set forth in IDAPA 58.01.05.011 (40 CFR § 268, Subpart D) and the applicable prohibition level(s) set forth in IDAPA 58.01.05.011 (40 CFR § 268.32) or Section 3004(d) of RCRA. The notice must be in accordance with IDAPA 58.01.05.011 (40 CFR § 268.7).

Required LDR notices are provided by point-of-generation facility personnel. The notifications are reviewed by facility personnel prior to waste treatment and are entered into the treatment unit's operating log. ~~Since the PEWE, LET&D systems, and ETS are segments of an overall treatment train,~~ LDR requirements identified at the point of generation are carried through the entire ILWMS. Compliance with the required treatment standards specified in IDAPA 58.01.05.011 (40 CFR § 268) ~~will be~~ ~~are~~is evaluated following treatment in the~~ treatment alternative selected by the DOE~~IWTU. Required LDR notifications ~~will be~~ are prepared prior to shipment of any treatment residuals for final disposal.

C-2b Test Methods: [IDAPA 58.01.05.008; 40 CFR § 264.13(b)(2)]

Waste Analysis

Analytical methods employed are primarily taken from *EPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846, Third Edition or later). In those cases where method-defined parameters[1] are required by regulation, SW-846 methods are always employed. Examples of method-defined parameter methods, where the analytical result is wholly dependent on the process used

[1]The use of an SW-846 method is mandatory for the following Resource Conservation and Recovery Act (RCRA) applications contained in 40 CFR Parts 260 through 270:

- Section 260.22(d)(1)(i) - Submission of data in support of petitions to exclude a waste produced at a particular facility (i.e., delisting petitions)
- Section 261.22(a)(1) and (2) - Evaluation of waste against the corrosivity characteristic
- Section 261.24(a) - Leaching procedure for evaluation of waste against the toxicity characteristic
- Section 261.35(b)(2)(iii)(A) - Evaluation of rinsates from wood preserving cleaning processes
- Sections 264.190(a), 264.314(c), 265.190(a), and 265.314(d) - Evaluation of waste to determine if a free liquid is a component of the waste
- Sections 264.1034(d)(1)(iii) and 265.1034(d)(1)(iii) - Evaluation of organic emissions from process vents
- Sections 264.1063(d)(2) and 265.1063(d)(2) - Evaluation of organic emissions from equipment leaks
- Section 266.106(a) - Evaluation of metals from boilers and furnaces
- Sections 266.112(b)(1) and (2)(i) - Certain analyses in support of exclusion from the definition of a hazardous waste for a residue which was derived from burning hazardous waste in boilers and industrial furnaces
- Sections 268.7(a), 268.40(a), (b), and (f), 268.41(a), 268.43(a) - Leaching procedure for evaluation of waste to determine compliance with land disposal treatment standards
- Sections 270.19(c)(1)(iii) and (iv), and 270.62(b)(2)(i)(C) and (D) - Analysis and approximate quantification of the hazardous constituents identified in the waste prior to conducting a trial burn in support of an application for a hazardous waste incineration permit
- Sections 270.22(a)(2)(ii)(B) and 270.66(c)(2)(i) and (ii) - Analysis conducted in support of a destruction and removal efficiency (DRE) trial burn waiver for boilers and industrial furnaces burning low risk wastes, and analysis and approximate quantification conducted for a trial burn in support of an application for a permit to burn hazardous waste in a boiler and industrial furnace. Federal Register, Thursday, November 20, 1997, Vol. 62, No. 224, 62079.

to make the measurement, include the use of the toxicity characteristic leaching procedure (TCLP) to prepare a leachate, flash point, pH, corrosivity tests, and paint filter liquids. The cited test methods will be performed at the laboratories per controlled implementing procedures.

The U.S. EPA provides for a degree of flexibility in the use of SW-846 and other approved methods. This flexibility is dependent on the maintenance of precision, accuracy (or bias), recovery, representativeness, comparability, and sensitivity (detection, quantitation, or reporting limits) relative to the data quality objectives for the intended use of the analytical results. "If an alternative analytical procedure is employed, then EPA expects the laboratory to demonstrate and document that the procedure is capable of providing appropriate performance for its intended application. This demonstration must not be performed after the fact, but as part of the laboratory's initial demonstration of proficiency with the method. The documentation should be in writing, maintained in the laboratory, and available for inspection upon request by authorized representatives of the appropriate regulatory authorities" (SW-846, Chapter Two, "Choosing the Correct Procedure").

Joint EPA/NRC guidance[2] for mixed waste also provides flexibility in sample sizes with method-defined parameter methods, as long as the resulting test is sufficiently sensitive to measure the constituents of interest at the regulatory levels prescribed in the TCLP. Other variances to published testing and sampling protocols are permissible under 40 CFR §§ 260.20-21, but must be approved prior to implementation by the Director of the Department of Environmental Quality (DEQ).

The EPA allows for the use of recognized methods other than those prescribed in SW-846. "Whenever methods from SW-846 are not appropriate, recognized methods from source documents published by the EPA, American Public Health Association (APHA), American Society for Testing and Materials (ASTM), the National Institute for Occupational Safety and Health (NIOSH), or other recognized organizations with appropriate expertise should be used, if possible" (SW-846, Chapter One).

Because of the broad range of acceptable methods available for testing specific constituents, and with the rapid incorporation/deletion of methods, not all of the SW-846 methods are specified in Tables C-1 and C-2. Only the currently defined parameter methods are specified.

Certain waste streams are generated at the INTEC that require remote handling and are subject to full RCRA characterization requirements. The remote sample handling requirements and specific process

[2] *Federal Register*, Thursday, November 20, 1997, Vol. 62, No. 224, 62079.

stream requirements may cause deviations in some required analyses systems. For example, the EPA has determined that "if the analyst can demonstrate that the test is still sufficiently sensitive (in the case of reduced sample size in a TCLP extraction) to measure the constituents of interest at the regulatory levels specified in the TCLP and representative of the waste stream being tested" then the sample size can be legitimately decreased[3]. Sample size becomes a critical factor, especially with respect to radiation exposure hazards, and therefore, must be a factor for consideration in any sampling or analytical activity.

The analyses may be performed at INL laboratories or at approved off-Site laboratories. Laboratories contracted by the ~~management and operating (M&O)~~ DOE-designated contractor to perform outside work are audited periodically, to ensure that each laboratory's quality control procedures and standard practices manuals meet the requirements for laboratories conducting EPA test procedures. If the laboratory has not been audited, or has failed to conform to the audit criteria, that laboratory is not authorized by the ~~M&O~~ DOE-designated contractor to conduct waste characterization analysis.

Process Knowledge

The EPA/Nuclear Regulatory Commission (NRC) guidance emphasizes the use of process knowledge to determine if a radioactive waste is hazardous, as a way to avoid unnecessary exposures to radioactivity. Examples of the types of process knowledge information used to characterize wastes for the ILWMS are presented in Attachment 2, Section C-2a of this permit. The INL documents process knowledge through WDDFs (waste stream profiles), correspondence, and memoranda maintained in the Document Management System. As a best management practice, the characterization documentation for all active waste streams is reviewed and each stream recertified annually to ensure the information maintained remains accurate and complete.

All waste characterization information, including documentation of process knowledge, is maintained in the facility operating record.

C-2c Sampling Methods: [IDAPA 58.01.05.008 and 005; 40 CFR § 264.13(b)(3), Part 261 Appendix I]

Facility personnel, in conjunction with ~~WDS~~WGS, and other organizations as needed, are responsible for initially characterizing wastes before they are received into the ~~PEWE system~~ILWMS. Personnel can use process knowledge and/or testing to adequately characterize waste. As part of

[3] Federal Register, Thursday, November 20, 1997, Vol. 62, No. 224, 62079.

characterization, the appropriate sampling method is selected based on knowledge of the waste material matrix (e.g., solid, liquid, sludge, radiological component) and radiation exposure considerations, as well as the specific analyte of interest. Facility personnel are also responsible for arranging all sampling and laboratory support and for sample shipments. Sampling personnel document the sampling activities and chain of custody.

Representative waste samples are obtained in accordance with the sampling approaches described in Chapter Nine of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846, current edition). Samples are collected using appropriate equipment and methods identified in, but not limited to, the following sources:

- EPA Test Methods for Evaluating Solid Waste, SW-846, Chapter 10, "Sampling Methods," Third Edition
- 40 CFR 261, Appendix I, "Representative Sampling Methods"
- Annual Book of ASTM Standards, American Society for Testing and Materials, Current issue
- Characterization of Hazardous Waste Sites - A Methods Manual, Volume II, Available Sampling Methods, EPA-600/4-84-076, 2nd Edition, December 1984
- "Characterizing Heterogeneous Wastes: Methods and Recommendations," EPA/600/R-92/033, February 1992
- EPA Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes: A Guidance Manual, April 1994
- Other recognized methods from source documents published by the EPA, American Public Health Association, American Society for Testing and Materials, the National Institute for Occupational Safety and Health, or other recognized organizations with appropriate expertise.

Sampling methods that deviate from approved or other recognized methods must be approved prior to implementation by the Director of the DEQ.

C-2c(1) Standard Sampling Methods

Samples from the ILWMS are typically collected through double hypodermic-needle (double-needle) samplers, sample nozzles, or spigots. Both double-needle samplers and sample nozzles utilize airflow to induce a vacuum that draws liquids from the system into sample vials/containers. Due to the radioactive nature of wastes handled in the ILWMS, much of the tank and miscellaneous treatment systems are constructed below ground for shielding purposes. In order to comply with DOE orders to maintain personnel exposure to radiation as low as reasonably achievable (ALARA), these sampling methods are employed in lieu of mechanical devices such as pumps. Mechanical devices would require the generation of large quantities of decontamination solutions to perform preventive maintenance, require confined space entries, and result in personnel exposure to high radiation. Utilizing airflow sampling devices has resulted in fewer sampling failures and dramatically reduces exposure hazards to sampling personnel. Some gravity-flow spigot samplers are located in areas where access and reduced exposure hazard allow. Appendix IV of this permit contains a report from Science Applications International Corporation entitled, "Final Report for Organics Partitioning Resulting from Operation of an INTEC Double-Needle Sampler, Revision 1," dated September 24, 2002. This study compares organic concentrations obtained from double-needle and spigot sampling techniques to determine whether potential stripping of organics occurs. The results of these tests indicate that INTEC sample collection and handling procedures do not significantly affect the concentration of volatile or semi-volatile organic constituents in the waste stream.

Liquid sampling is conducted in accordance with approved sampling and operating procedures which provide instructions for sampling and handling high radiation liquids and other special considerations. In general, where standard samples are collected, the following basic sampling procedure is used as appropriate:

- Obtain samples using precleaned sample equipment, in accordance with the applicable method.
- Fill sample containers. Uniquely identify and label each sample, and document necessary information in the field record (e.g., location, time, characteristics).
- Properly clean and decontaminate the exterior of the sample containers and the sampling hardware.
- Complete the chain-of-custody forms and retain a record copy.
- Deliver the samples and associated forms to the laboratory.

Sampling procedures for certain mixed wastes may deviate from the standard sampling protocols, due to the hazards associated with radioactive materials. For example, due to radiological concerns, the use of remotely operated sample transfer systems may limit the size of sample containers, prevent sealing of the transfer receptacle, or preclude chain-of-custody and other documentation from directly accompanying the samples. However, all sampling procedures are consistent with the stated goals of SW-846, to collect representative samples and to maintain their physical and chemical integrity.

Equipment used to sample waste is disposable or designed for decontamination. Contaminated disposable equipment is managed appropriately. Equipment that can be cleaned and reused is thoroughly decontaminated before reuse or storage. Decontamination solutions are managed appropriately.

C-2c(1)(a) Field Records

Records provide direct evidence and support for the necessary technical interpretations, judgments, and discussions concerning project activities. These records, particularly those anticipated to be used as evidentiary data, directly support current or ongoing technical studies and activities, and provide the historical evidence needed for later reviews and analyses.

Field records may consist of bound field notebooks, sample collection forms, personnel qualification and training forms, sample location maps, equipment maintenance documentation, chain-of-custody forms, and/or sample analysis request forms. Records may include, but are not limited to the following, as applicable:

- Sample Collection - To ensure maximum utility of the sampling effort and resulting data, documentation of sampling protocol, as performed in the field, is essential. Sample collection records may contain the names of persons conducting the activity, sample number, sample location, date and time the sample was taken, equipment used, climatic conditions, documentation of adherence to protocol, and unusual observations.

- Chain-of-Custody Records - The chain of custody involving the possession of RCRA characterization samples from the time they are obtained until they are disposed or shipped off-Site are documented, and may include the project name, signatures of samplers, sample number, date and time of collection, grab or composite sample designation, signatures of individuals involved in sample transfer; and if applicable, the air bill or other shipping number.

- Quality Control (QC) Samples - Documentation for generation of QC samples, such as trip and equipment rinsate blanks, duplicate samples, and any field spikes, are maintained.

- Deviations - All deviations from normal sampling and analysis protocols are recorded in the site logbook or project records.

- Reports - A copy of any report issued and any supporting documentation are retained.

C-2c(2) Quality Control

Defensible and valid data are obtained through implementation of the processes controlling characterization and/or sampling and analysis. Such processes include the use of field and laboratory control samples, data validation, sampling performance assessments, and as necessary, corrective action(s) as identified in this section.

C-2c(2)(a) Field Control Samples

Control samples are QC samples that are intended to monitor the performance of the sampling system. In accordance with this WAP, the following field control samples may be collected:

- Field duplicates
- Equipment rinsate
- Trip blank-sample.

C-2c(2)(b) Laboratory Quality Control

Laboratories maintain QA programs to ensure the quality of data produced. Depending on the data end use and overall data quality objectives (DQOs), the laboratory QC samples may include:

- Matrix spike
- Matrix duplicate
- Matrix spike duplicate
- Laboratory blanks
- Control standards.

Off-Site laboratories must be INL approved. This approval process requires off-Site laboratories to pass stringent audit criteria included in the DOE Environmental Management Consolidated Audit Program (EMCAP). The EMCAP maintains audit checklists for such laboratory activities as general laboratory practices, quality assurance management systems, organic/inorganic data quality, radiochemistry data quality, electronic data management, hazardous and radioactive materials management, and industrial hygiene. These checklists are available to all facilities within the DOE complex via the internet, promoting thorough and consistent evaluation of all analytical facilities. Once approved, laboratories are audited at regular intervals to ensure performance and QA/QC standards are met.

C-2c(2)(c) Data Validation

Depending on the data end use and overall project DQOs, data validation may include evaluation of the following subjects:

- Completeness of laboratory records with regard to processing of all required samples and analyses
- Implementation of appropriate procedures
- Evaluation of sample analytical data to required detection and quantity
- Evaluation of QC analytical data to applicable control criteria
- Comparison of sample holding times to the required holding times prescribed by this WAP.

All deviations from the applicable guidance are documented and corrective actions implemented as necessary.

C-2c(2)(d) Sampling Performance Assessment

A key function of a QC program is the periodic assessment of activities for conformance to required protocols. Sampling performance assessments may evaluate the following activities:

- Completeness of Field Reports - This evaluation determines that a complete record exists for each field activity and that the procedures specified by this WAP or the documents implementing this WAP were executed.

- Identification of Valid Samples - This review involves the evaluation and interpretation of field records to detect problems affecting the representativeness of samples.

All resultant concerns are documented and corrective actions implemented as necessary.

C-2c(2)(e) Corrective Action

Corrective action measures can be divided into two categories as follows:

- Project Corrective Action - Corrective actions are performed when the project objectives are not met, when conditions adverse to quality have been identified, or when an assessment of data reveals questionable or unknown data quality. Conditions adverse to quality are identified promptly, and corrected as soon as possible. When significant conditions adverse to quality are identified, the causes are determined, and corrective actions to prevent their recurrence are performed and documented.

- Laboratory Corrective Actions - The laboratory possesses a QA plan identifying analytical acceptance criteria and what actions to take when these criteria are not satisfied.

C-2c(3) Process Sampling

Process samples are collected on a routine basis prior to transfers from waste collection tanks to the PEWE, ~~and~~ LET&D, ETS, and IWTU systems. Process samples are analyzed for specified parameters to ensure ILWMS tolerance limits are met and to promote optimum operability of the miscellaneous treatment units. In some instances it may be possible to blend wastes or introduce additives, such as complexing agents, to bring constituents within the unit tolerance limits provided in Attachment 1, Section D-8b(5) of this ~~Part B~~ permit.

Table C-3 identifies where and when process sampling is conducted and identifies the parameters that may be examined for samples from each location. Process samples may also undergo analyses for total radiation or specific radionuclides. These parameters are not listed in Table C-3.

Process sampling is conducted to optimize system performance, not for RCRA characterization of wastes. Therefore chain of custody and RCRA QC procedures are not followed for process samples.

Table C-3. ILWMS Typical Process Sampling Locations

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
Deep Tanks VES-WG-100, VES-WG-101, VES-WH-100, VES-WH-101	Prior to each transfer to the PEWE system	Double-needle	Acidity,	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility.
			Flashpoint,	Ensure waste is not ignitable.
			Aluminum,	Ensure adequate quantity to complex fluorides.
			Chlorides,	Ensure within tolerance range[a].
			Fluorides,	Ensure within tolerance range[a].
			Aluminum:Fluoride ratio,	Ensure that fluorides are adequately complexed.
			Mercury,	Determine mercury loading.
			Nitrates,	Indicator of nitric acid content. Ensure vessel passive layer is maintained.
			Sulfates,	Ensure within tolerance range[a].
			Total organic carbon	Ensure compliance with Subparts AA/BB.

Table C-3. ILWMS Typical Process Sampling Locations (continued)

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
WWH Tanks VES-WL-103, VES-WL-104, VES-WL-105	Prior to each transfer to the PEWE system	Double-needle	Acidity,	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility.
			Flashpoint,	Ensure waste is not ignitable.
			Aluminum,	Ensure adequate quantity to complex fluorides.
			Chlorides,	Ensure within tolerance range[a].
			Fluorides,	Ensure within tolerance range[a].
			Aluminum:Fluoride ratio,	Ensure that fluorides are adequately complexed.
			Mercury,	Determine mercury loading.
			Nitrates,	Indicator of nitric acid content. Ensure vessel passive layer is maintained.
			Sulfates,	Ensure within tolerance range[a].
			Total organic carbon	Ensure compliance with Subparts AA/BB.

Table C-3. ILWMS Typical Process Sampling Locations (continued)

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
NWCF Tanks VES-NCD-123, VES-NCD-129,	Prior to each transfer to the PEWE system	Double-needle	Acidity,	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility.
			Specific gravity,	Indicator of a representative process sample. Promote operational efficiency.
			Aluminum,	Ensure adequate quantity to complex fluorides.
			Chlorides,	Ensure within tolerance range[a].
			Fluorides,	Ensure within tolerance range[a].
			Aluminum:Fluoride ratio,	Ensure that fluorides are adequately complexed.
			Mercury,	Determine mercury loading.
			Sulfates,	Ensure within tolerance range[a].
			Total organic carbon	Ensure compliance with Subparts AA/BB.
VES-NCC-119, VES-NCC-122	Prior to each transfer to the PEWE system unless process knowledge indicates no changes to the wastes (e.g., during ETS processing)	Double-needle	Acidity,	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility.
			Flashpoint,	Ensure waste is not ignitable.
			Specific gravity,	Indicator of a representative process sample. Promote operational efficiency.
			Aluminum,	Ensure adequate quantity to complex fluorides.
			Chlorides,	Ensure within tolerance range[a].

Table C-3. ILWMS Typical Process Sampling Locations (continued)

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
			Fluorides, Aluminum:Fluoride ratio, Mercury, Sulfates, Total organic carbon	Ensure within tolerance range[a]. Ensure that fluorides are adequately complexed. Determine mercury loading. Ensure within tolerance range[a]. Ensure compliance with Subparts AA/BB.
Process Condensate Collection Tanks VES-WL-106, VES-WL-107, VES-WL-163	Prior to each transfer to the LET&D unless process knowledge or prior analytical results indicate that the waste is unacceptable for the LET&D	Nozzle	Acidity, Aluminum, Fluoride, Total organic carbon	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility. Ensure adequate quantity to complex fluorides. Ensure within tolerance range[a]. Ensure compliance with Subparts AA/BB.

Table C-3. ILWMS Typical Process Sampling Locations (continued)

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
LET&D Bottoms Tank VES-WLL-195	Infrequently, to validate nitric acid concentration	Nozzle	Acidity, Chlorides, Fluorides, Nitrates	Validate concentration of nitric acid. Determine chloride carryover. Determine fluoride carryover. Validate concentration of nitric acid.
Blend and Hold Tanks VES-NCC-101, VES-NCC-102, VES-NCC-103	Prior to ~~using feed from a different TFF tank.~~ each new TFF batch transfer to the ETS	Double-needle	Acidity, Specific gravity, Aluminum, Chlorides, Fluorides, Aluminum:Fluoride ratio, Mercury, Sulfates, Flashpoint,	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility. Indicator of a representative process sample. Promote operational efficiency. Ensure adequate quantity to complex fluorides. Ensure within tolerance range[a]. Ensure within tolerance range[a]. Ensure that fluorides are adequately complexed. Determine mercury loading. Ensure within tolerance range[a]. Ensure waste is not ignitable.

Table C-3. ILWMS Typical Process Sampling Locations (continued)

LOCATION	TIME	SAMPLER TYPE	PARAMETERS	RATIONALE
VES-NCC-102, VES-NCC-103	Prior to each new batch transfer from a new TFF tank to the IWTU, unless characterization of the TFF tank has been completed.	Double-needle	Acidity Specific gravity Chlorides Fluorides Mercury	Indicator of a representative process sample. Inhibit formation of precipitates. Ensure compatibility. Indicator of a representative process sample. Promote operational efficiency. Ensure within tolerance range[a] Ensure within tolerance range[a] Determine mercury loading
F-SRH-141A/B	Monthly	Offgas sampler	Mercury	Determine whether Mercury Adsorber primary and/or secondary bed material should be replaced

a. ILWMS tolerance limits are provided in Section D-8b(5).

In addition, duplicate samples and field blanks are not generally utilized during process sampling activities. However, laboratory QA/QC procedures will be followed at all times to ensure the performance of analytical instrumentation and the validity of sample results. If process sampling results are inconsistent with the waste characterization information provided by the generator or indicate that the waste generating process may have changed, then the waste is recharacterized.

C-2d Frequency of Analyses: [IDAPA 58.01.05.008; 40 CFR § 264.13(b)(4)]

Waste stream characterizations are reviewed and recertified annually to ensure continued accuracy of the information provided. Typical waste streams managed by the ILWMS are generated several times a year from highly controlled processes in which the waste composition remains consistent for the duration of the year. Recharacterization is required when:

- The process generating an established waste stream changes
- The waste characteristics are highly variable from batch to batch
- There is reason to suspect a change in the waste based on inconsistencies in the packaging or labeling of the wastes, or there are inconsistencies between the waste verification results and the waste characterization data provided by the generator
- Facility personnel reject the waste because it is inconsistent with the profile for that waste.

Facility personnel can require additional waste analysis to substantiate waste characterization data prior to acceptance of a waste.

C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes: [IDAPA 58.01.05.008; 40 CFR §§ 264.13(b)(6), 40 CFR 264.17]

Each waste stream proposed for treatment or storage in the units addressed in this permit is evaluated for all applicable RCRA characteristics by ~~WDS~~ WGS personnel as part of the waste characterization process. Small quantities of low TOC ignitables (EPA HWN D001) may enter the ILWMS through the CPP-601 Deep Tanks as a result of laboratory sample preparation and cleaning activities. Sampling and analysis has demonstrated that when these small quantities of ignitable waste are aggregated with other wastes in the CPP-601 Deep Tanks to facilitate treatment, the characteristic of ignitability is lost. However, the HWN D001 is tracked through the ILWMS to account for these ignitable materials and any underlying hazardous constituents (UHCs) to ensure proper cradle-to-grave management of mixed and hazardous wastes. As identified in Table C-3 of Section C-2c(3), process samples are taken from the CPP-601 Deep Tanks prior to each transfer to the PEWE system and tested for flashpoint to ensure the feed stream is not ignitable.

Incompatibility determinations are based on the characterization data developed by ~~WDS~~ WGS during initial characterization activities. The storage and miscellaneous treatment units operate in accordance with defined procedures that demonstrate how these data are used to prevent incompatible wastes, including reactives, from contacting one-another. The tables in Appendix V of 40 CFR 264/265 and 49 CFR § 177.848 are examples of resources that may be used to determine compatibility. In addition, the quantity and concentration of wastes or chemicals to be commingled are considered for compatibility determinations.

In order to protect equipment and promote effective treatment, chemical additives may be introduced into the ILWMS. Chemicals added include:

- Nitric acid – recovered from the LET&D facility or purchased as a commercial product to inhibit the formation of precipitates and to ensure passive layer formation on stainless-steel vessels and piping
- Aluminum nitrate – purchased as commercial product to complex fluorides, reducing corrosion to the system
- Sodium hydroxide (rust remover) – purchased as a commercial product for descaling equipment~~.~~
- Potassium Permanganate – purchased as a commercial product for descaling equipment

Other chemical commercial products, including oxalic acid and potassium permanganate, may be used during decontamination activities. These chemicals are not added to promote treatment of wastes and are therefore not considered tank treatment (T01).

The chemical additives described above are typically added to tank systems through decontamination headers/lines or through preventative maintenance areas. Mixing occurs via air sparge, mechanical mixers, or recirculation. Chemical addition is controlled through standard operating procedures, which specify the quantity/concentration of each chemical to be added and require review and approval by a system engineer. These controls maintain compatibility and provide adequate protection of equipment.

The WTS evaluates for the characteristic of reactivity during the waste characterization process. If, based on the information provided by the source generating the waste, the waste is a new, unused chemical product that is either a P- or U-listed waste for which reactivity is the basis for listing, the waste is considered a reactive waste. If the waste is a mixture that contains P- or U-listed constituents for which reactivity is the basis for listing, the waste is evaluated to determine if the waste matrix will be a reactive waste. Consideration must be given to concentration, purity, and processes in which the chemicals have been previously employed, the matrix in which they may be combined, specific characteristics of the chemicals (i.e., volatility, mobility, reaction to water and/or other solvents, viscosity, density, pH, etc.), cumulative chemical effects, and the time the chemical constituents have been in contact with each other. The ILWMS will not manage wastes that exhibit the characteristic of reactivity, EPA HWN D003.

The safety analysis documentation for the ILWMS indicates that, under the proper conditions, two potentially explosive reactions could occur. These reactions are tributyl phosphate (TBP) with nitric acid and hexone with nitric acid. ~~Due to the temperature requirements necessary for these reactions, the only units described in this Part B permit that could potentially sustain these reactions are the PEW evaporators, the LET&D fractionators and the ETS.~~

Conditions necessary for a TBP/nitric acid reaction include appropriate TBP concentration and elevated temperature (studies have shown that this reaction does not become extremely exothermic until the solution reaches 186° C).

~~The quantity of TBP in the ILWMS is extremely small. Since the end of fuel reprocessing activities at the INTEC in the early 1990's, no TBP has been added to the system. In addition, all liquids in the INTEC TFF have already been evaporated at least once, further reducing the volume of TBP.~~

~~The PEWE, LET&D, and ETS facilities operate at much lower temperatures than are necessary to sustain a TBP/nitric acid reaction. Maximum operating temperatures for these facilities are 108° C for the PEW evaporators, 118° C for the LET&D fractionators, and 117°C for the ETS. Deviations from these maximum operating temperatures result in waste feed cutoffs and/or shutdown of the system well before a temperature of 186° C can be reached.~~

In order for a hexone/nitric acid reaction to occur, similar conditions must exist. A reaction can only be sustained if an adequate concentration of hexone is present and necessary temperature requirements are met. ~~The flashpoint of hexone in water at the elevation of the INL is 133° F (56° C) at a concentration of 2000 mg/L.~~

~~Like TBP, hexone is present in INTEC liquid wastes in only minimal concentrations. However, since the operating temperatures of the PEW evaporators, LET&D fractionators, and ETS are high~~

~~enough to sustain a hexone/nitric acid reaction, under the appropriate conditions, the concentration of TOC allowed in the feed to the ILWMS is limited to 800 mg/L. To ensure conservatism, all TOC is assumed to be hexone. This tolerance limit is identified in Attachment 1, Section D-8b(5) of this permit for the PEWE, LET&D, and ETS facilities.~~

~~Furthermore, the LET&D facility is operated as an open system. The LET&D fractionators are maintained at a pressure of -20 in. water column. Both the TBP/nitric acid and the hexone/nitric acid scenarios require a closed system to sustain a reaction. The conditions in the LET&D facility preclude either reaction from occurring. If a vacuum cannot be maintained, the treatment process is automatically shut down.~~

~~Therefore, the risk of explosive TBP/nitric acid reactions is eliminated due to low reactant concentrations, inadequate temperature, and open vessel conditions in the LET&D fractionators. Similarly, hexone/nitric acid reactions cannot occur due to low reactant concentrations, which are further regulated by administrative controls, and open vessel conditions on the LET&D fractionators.~~ Provided as Appendix C-2 to this section of the permit is a report entitled, "Organic Compounds in INTEC Tank Farm Waste," ICP/EXT-05-00962, September 2005. This report summarizes historical analytical results from samples of INTEC TFF wastes. Tables 5, 6, and 8 of this report show analytical results for wastes currently stored in tanks VES-WM-189 and VES-WM-188. The waste contained in VES-WM-187 is derived from similar processes and has been processed and mixed in the ILWMS in the same way as the other tanks. These results show that TFF liquids contain less than or equal to 44 parts per billion of TBP and less than or equal to 10 parts per billion of hexone. Furthermore, TBP and hexone are no longer used at INTEC. Therefore, additional volumes of these compounds will not be introduced into ILWMS feed streams. The low reactant concentrations in the waste that would be available for potentially explosive TBP/nitric acid and hexone/nitric acid reactions mitigate any risk to ILWMS operations.

C-3 WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS [IDAPA 58.01.05.011; 40 CFR § 268]

The Hazardous and Solid Waste Amendments to RCRA authorize the land disposal of certain types of wastes only if LDR treatment standards are met. Information provided in this section describes the additional characterization requirements for assessing LDR applicability and compliance with the treatment standards before land disposal.

C-3a Waste Characterization

The ILWMS is a highly acidic waste treatment system. The system is designed and operated as part of an overall liquid waste treatment train. Maintaining an acidic condition is necessary in order to keep metals and radioactive isotopes in solution and prevent chloride- and fluoride-induced corrosion. The waste undergoing treatment is a known restricted waste due to corrosivity, toxicity characteristics for metals, and previous receipt of listed waste into the system.

LDR applicability is determined for each waste at the point of generation based on the EPA HWNs assigned to individual waste streams. Before receipt into the ILWMS, wastes undergo initial characterization for EPA HWN applicability and LDR requirements. Once LDRs are identified, they remain applicable through treatment and/or disposal of the final waste form produced by the IWTU. ~~This final waste form will depend on the ultimate treatment alternative selected by the DOE.~~ Final assessment and compliance with LDR treatment standards will take place before land disposal by evaluating the final waste form. This assessment will take place on-Site and appropriate LDR notifications will be completed as described in Attachment 2, Section C-2a(2) of this permit. Applicable LDR documentation will be provided to the disposal facility in accordance with IDAPA 58.01.05.011 (40 CFR § 268.7).

The characterization process for purposes of LDR is the same as that employed during the initial characterization process noted in past sections. Facility personnel, with the assistance of ~~WDS~~WGS, and other organizations as needed, conduct hazardous waste determinations before management of the waste. The hazardous waste determination includes, where applicable, characteristic and listed EPA HWN determinations in addition to identification of wastewater and non-wastewater treatability groups, UHCs, LDR subcategories, and LDR treatment standards applicable to the waste.

During the initial characterization process, facility personnel select parameters and rationale for testing based on the rationale presented in Table C-2 and on the applicable LDR requirements found within IDAPA 58.01.05.011 and 40 CFR § 268 or process knowledge. If the waste is determined to be subject to the LDR requirements, facility personnel determine if the waste is a wastewater or non-wastewater and also determine applicable subcategories. Total organic carbon (TOC) and total suspended solids (TSS) analyses may be used to conduct wastewater/non-wastewater determinations, in cases where process knowledge is not adequate. Additional information on the characterization process is found in Sections C-1 and C-2.

Waste generated at the ILWMS from activities such as maintenance and spill cleanup will undergo a hazardous waste determination based on testing and/or process knowledge as outlined within this document before it is returned to the ~~PEWE~~ ILWMS or managed elsewhere. If the waste is determined to be subject to LDR requirements, facility personnel will determine if the waste is a wastewater or non-wastewater and applicable subcategories using the parameters shown in Table C-2 or process knowledge.

C-3b Sampling and Analytical Procedures

Sampling and analysis will follow the same approach as outlined within Sections C-2 through C-2c. Test methods used to assess LDR treatment standards will be based on total analysis unless otherwise specified in IDAPA 58.01.05.011 (40 CFR §§ 268.40 through 268.48).

C-3c Frequency of Analysis

Compliance with ~~all~~ applicable LDR requirements will be demonstrated and documented prior to disposal of the final waste form. ~~As previously mentioned, the final waste form will be determined by the final treatment alternative selected by the DOE.~~ All LDR compliance documentation will be maintained in the facility operating record.

C-3d Additional requirements for treatment facilities

C-3d(2) Analysis of treatment residues

Treatment residues produced by the units described in this permit include: 1) PEWE overhead condensate that is subsequently processed in the LET&D facility; 2) PEWE bottoms that are returned to the TFF; 3) LET&D bottoms that are primarily comprised of recovered nitric acid and used elsewhere at the INTEC in lieu of purchasing commercial-grade nitric acid, 4) ETS overhead condensate that is subsequently processed in the PEWE, ~~and~~ 5) ETS bottoms that are returned to the TFF, and 6) IWTU treatment product ~~captur~~collected in IWTU reformers and filtration devices. Analyses of many of these treatment residuals for the purposes of RCRA characterization are conducted infrequently because ~~these units~~ the PEWE, LET&D, and ETS are part of an overall treatment train. The PEWE was constructed of materials compatible with ETS overheads. Since the PEWE is the next step in the overall treatment process, characterization of ETS overhead condensate is not routinely performed. Similarly, ~~T~~the LET&D facility was specifically designed and constructed of materials to process PEWE overhead condensate. Since the LET&D is the next step in the treatment train, characterization of PEWE overhead condensate is not routinely performed. However, process sampling of treatment residuals is normally conducted to ensure optimum operation of the overall treatment process.

~~Once the final treatment alternative is identified by the DOE, wastes returned to the TFF will be processed.~~ Complete RCRA characterization of IWTU treatment product and ILWMS secondary wastes is completed as required by the ultimate disposal facility and is performed as described in C-2a(2) of this permit. Treatment residuals produced from this process will be analyzed for all applicable LDR treatment standards. Compliance with ~~all~~ appropriate LDR requirements will be documented prior to land disposal. LDR documentation will be maintained in the facility operating record. ~~Until such time that a final treatment alternative is identified, PEWE bottoms will continue to be transferred to the TFF for storage.~~

C-3d(3) Sampling and analytical procedures

Sampling and analysis will follow the same approach as outlined within Sections C-2 through C-2c. Test methods used to assess LDR treatment standards will be based on total analysis unless otherwise specified in IDAPA 58.01.05.011 (40 CFR §§ 268.40 through 268.48).~~Since the ILWMS does not produce the final waste form (i.e., the form that can be land disposed), sampling and analysis procedures for determination of LDR treatment standard compliance do not exist. The final evaluation [as noted above in C-3d(2)] will take place when the final waste form is produced.~~

C-3d(4) Frequency of analysis

Compliance with applicable LDR requirements will be demonstrated and documented prior to disposal of the final waste form. All LDR compliance documentation will be maintained in the facility operating record.

~~The permit for the ultimate treatment alternative selected by the DOE will describe the frequency of analysis for demonstrating compliance with LDR treatment standards.~~

C-4 SUBPART AA, SUBPART BB AND SUBPART CC APPLICABILITY [IDAPA 58.01.05.008; 40 CFR §§ 264.1030, 264.1050, AND 264.1080]

40 CFR 264 Subpart AA Applicability

40 CFR 264 Subpart AA requires owners or operators of facilities with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations managing hazardous wastes with organic concentrations of at least 10 ppmw to either: 1) reduce total organic emissions from all affected process vents at the facility below 1.4 kg/hr (3 lb/hr) and 2.8 Mg/yr (3.1 tons/yr); or 2) reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent. A process vent is defined in 40 CFR 264.1031 as any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations.

The IWTU does not involve distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. As such, the IWTU stack does not meet the definition of a process vent in IDAPA 58.01.05.008 (40 CFR § 264.1031) and the requirements specified in 40 CFR 264 Subpart AA do not apply.

The PEWE and ETS offgas is processed through vessel offgas systems in Buildings CPP-604 and CPP-659 respectively and then sent to the APS in Building 649, prior to discharge to the main stack. Therefore, the PEWE and ETS vents do not meet the definition of a process vent and IDAPA 58.01.05.008 [40 CFR § 264.1031] does not apply.

Wastes in the process condensate collection tanks (VES-WL-106, -107, and -163) are sampled for TOC before being transferred to the LET&D facility. Historical sample results of the LET&D feed have been in the range of 30 to 200 ppm for TOC. Therefore 40 CFR Subpart AA is applicable to the LET&D facility.

The LET&D facility offgas system TOC emissions are controlled per the following calculations and methodology:

3 lbs/hr (454 g/lb) = 1362 g/hr = 1,362,000 mg/hr;

maximum feed rate = 550 gal/hour;

(550 gal/hr) (3.785 liters/gal) = 2,079 L/hr

(1,362,000 mg/hr) / (2,079 L/hr) = 655.1 milligrams/L = 655.1 ppm

To account for any potential sampling problems or analysis deviation, the LET&D feed limit has been set at 550 ppm. The maximum feed rate is 550 gallons per hour, and the minimum feed rate is design-limited to 275 gallons per hour, which would allow up to 800 ppm organics in the feed, assuming that all the organics are carried out in the offgas.

If sample analyses for TOC were greater than 800 ppm, the solution would not be fed to the LET&D and would be blended with other feed streams and recycled back to the PEWE system for reprocessing. The maximum TOC sample analysis of 800 ppm limits the feed rate of the LET&D to 275 gallons per hour. A TOC sample analysis of 550 ppm allows the LET&D to operate at 550 gallons per hour. The feed rate is adjusted linearly between 550 ppm and 800 ppm. If the feed rate is adjusted to less than the LET&D minimum feed rate of 275 gal/hr, based upon the TOC content of the feed, the system recycles the solution back to the PEWE system.

The feed rate in the LET&D is maintained to ensure TOC emissions are less than 3 lb/hr to ensure compliance with this regulation.

40 CFR 264 Subpart BB Applicability

IDAPA 58.01.05.008 (40 CFR 264 Subpart BB) applies to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10% by weight. Sampling of the PEWE, ~~system and~~ ETS, and IWTU inputs have shown the maximum TOC contained in the waste to be less than 800 ppm.

Since the TOC is less than 10 percent by weight, the requirements of 40 CFR 264 Subpart BB do not apply.

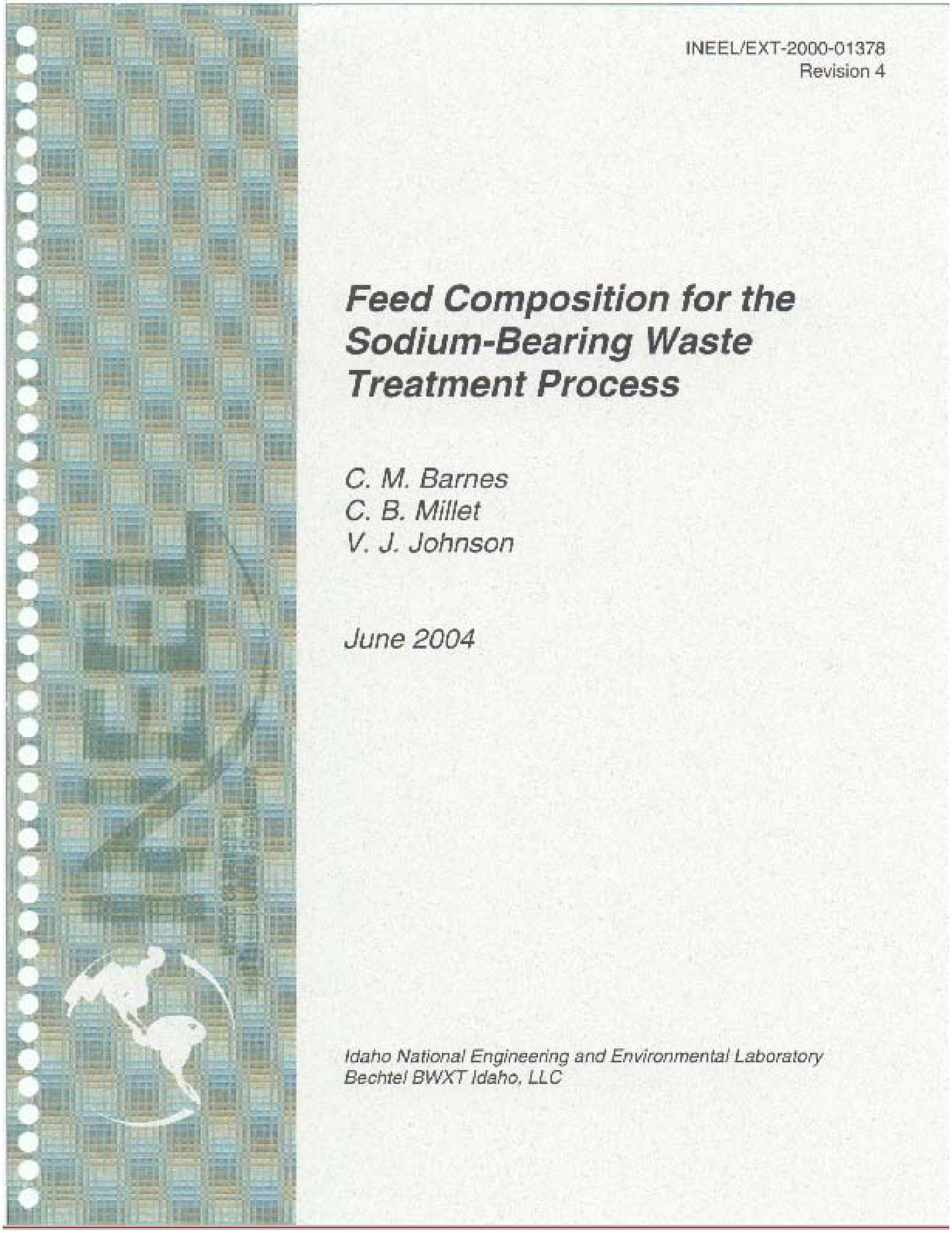
40 CFR 264 Subpart CC Applicability

40 CFR 264.1080(b)(6) exempts from applicability a waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.

Process liquids associated with the ILWMS are radioactive mixed waste and are exempt from regulation under Subpart CC.

APPENDIX C-1

Feed Composition for the SBW Waste Treatment Process



INEEL/EXT-2000-01378
Revision 4

Feed Composition for the Sodium-Bearing Waste Treatment Process

C. M. Barnes
C. B. Millet
V. J. Johnson

June 2004

Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

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APPENDIX C-2

Organic Compounds in INTEC Tank Farm Waste

ICP/EXT-05-00962

Organic Compounds in INTEC Tank Farm Waste

M. C. Swenson

September 2005

Idaho Cleanup Project

The Idaho Cleanup Project is operated for the
U.S. Department of Energy by CH2M • WG Idaho, LLC

Double click on the icon to display the document

APPENDIX C-~~1~~3

Example of an INL Waste Determination and Disposition Form

General Instructions:

WASTE STREAM NAME: ______________________ **MATERIAL PROFILE NUMBER:** ______________

WDDF NUMBER (OPTIONAL): ______________________ CHARGE #: ____________

WASTE STREAM CONTACTS											
Contact:	**Name**	**E-Mail**	**Phone**	**Pager**	**MS**	**Contact:**	**Name**	**E-Mail**	**Phone**	**Pager**	**MS**
Generator:						Technical Specialist:					
Facility Rep.:						Independent Reviewer:					

SECTION I: PROCESS KNOWLEDGE EVALUATION (Completed by the generator with assistance from the Facility Representative)

1. Waste Generation Location: Facility: Building/Room: Area: If applicable: Container #: Type/size:

2. Process and Waste Description: (Attachment Included: ☐ Yes ☐ No)

3. Were any waste minimization activities a part of this process: ☐ Yes ☐ No (If Yes, provide description or reference.)

4. Generation Status: ☐ Anticipated ☐ Existing ☐ Routine operations ☐ Cleanup/Stabilization Activities ☐ One Time Only ☐ On-going ☐ Secondary

5. Other generation information:

6. Physical Description (check all that apply): Color: ☐ Solid ☐ Organic Liquid ☐ Aqueous Liquid ☐ Sludge ☐ Aerosol ☐ Gas Cylinder ☐ Multi-Layered

7. Sources used for process evaluation (e.g. MSDS, operational logs, procedures, analyses):

8. Waste Characteristics**:** Note: The waste characteristics may not be known at time of initial determination. If required for treatment or characterization, those parameters will be identified at a later date.

Liquids		Solids		All	
a. pH (aqueous only): ☐ < 2 ☐ ≥ 12.5 ☐ > 2 or < 12.5 Exact	Method: ☐ NA	h. Asbestos: If yes, is it friable?	☐ Yes ☐ No ☐ NA ☐ Yes ☐ No ☐ NA	n. PCBs: If Yes, provide concentrations (actual & source) in composition table. PCBs Bulk Product? (40 CFR 761.62)?	☐ Yes ☐ No ☐ NA ☐ Yes ☐ No ☐ NA
b. Flash Point:	Method:	i. Pyrophoric (Water Reactive)	☐ Yes ☐ No ☐ NA	o. Sulfide ≥ 500 mg/kg	☐ Yes ☐ No ☐ NA
c. Total suspended solids <1%	☐ Yes ☐ No ☐ NA	j. Flammable Solid	☐ Yes ☐ No ☐ NA	p. Cyanide ≥ 250 mg/kg	☐ Yes ☐ No ☐ NA
d. Is total organic carbon <1%	☐ Yes ☐ No ☐ NA			q. Oxidizer	☐ Yes ☐ No ☐ NA
e. Fuming Acid/Acid Gases	☐ Yes ☐ No ☐ NA	k. Free liquids: If Yes, quantity volume %	☐ Yes ☐ No ☐ NA	r. Treatment Residue	☐ Yes ☐ No ☐ NA

WASTE STREAM NAME: ____________ **MATERIAL PROFILE NUMBER:** ____________

f. Pyrophoric (Air Reactive)	☐ Yes ☐ No ☐ NA	l. RCRA Debris (>60 mm) (≥ 50% by visual inspection) or non-RCRA Rubble	☐ Yes ☐ No ☐ NA ☐ Yes ☐ No ☐ NA	s. Explosive t. Radioactive	☐ Yes ☐ No ☐ NA ☐ Yes ☐ No ☐ NA
g. Water Reactive	☐ Yes ☐ No ☐ NA	m. Pyrophoric (Air Reactive)	☐ Yes ☐ No ☐ NA	u. Halogens (Cl, F, Br)	☐ Yes ☐ No ☐ NA

11. Waste Composition**:** (Must total 100%). Attachment Included: ☐ Yes ☐ No ☐ NA

Constituent	CAS No.	Analysis or PK	Range (If constituent is <1%, use mg/kg or mg/L, otherwise report in %) From	To	Units	Used as a Solvent? (Y/N)	Comments

12. Radioisotopes: Are radioisotopes present? ☐ ***Yes,*** *If Yes, refer to attachment* ☐ ***No,*** *If No, include signed form 435.02*

SECTION II: PROBABLE WASTE TYPE: (COMPLETED BY THE FACILITY REPRESENTATIVE AND USED TO ASSIGN WASTE TECHNICAL SPECIALIST AND FOR APPROPRIATE MANAGEMENT UNTIL FINAL WASTE DETERMINATION IS MADE.)

Based on evaluation of the process and available data the waste type indicated is (check all that apply):

☐ Hazardous Only	☐ Mixed	☐ Radioactive Only	☐ Conditional Industrial	☐ Used Oil
☐ Material Exchange	☐ Lab Pack	☐ Non-conditional Industrial	☐ TSCA	☐ Other – Describe:

☐ Recyclable: ☐ Non Radioactive Lead (>99+ % Lead) ☐ Lead Batteries ☐ Silver ☐ RCRA Scrap metal ☐ Other - Describe:

Indicated Waste Codes:

WASTE STREAM NAME: ______________________________ **MATERIAL PROFILE NUMBER:** ______________

CERTIFICATION

I certify that the information in Section I of this form and the applicable attachments are fully disclosed. A good faith effort has been put forward to acquire and verify the information. Willful or deliberate omissions have not been made, and all known and suspected hazards have, to the best of my knowledge, been identified. The WGS Facility Representative, based on information provided, has assigned a probable waste type in Section II.

Generator Name Typed/Printed	Signature	Date
WGS Facility Representative Name Typed/Printed	WGS Facility Representative Signature	Date

SECTION III WASTE DETERMINATION AND DISPOSITION (COMPLETED BY THE WGS TECHNICAL SPECIALIST)	
A. Waste Determination	
1. Is this a solid waste (per 40 CFR 261.2)? ☐ Yes ☐ No (If No, attach regulatory citation)	
2. Is this a Hazardous Waste (per 40 CFR 261.3)? ☐ Yes ☐ No	
3. Is waste excluded from regulation under 40 CFR 261.4? ☐ Yes ☐ No If Yes, Regulatory citation:	
4. Is waste subject to 40 CFR 268 regulations? ☐ Yes ☐ No If Yes, is the waste a: ☐ Waste Water or ☐ Non Wastewater. Is there a specified method of treatment? ☐ Yes ☐ No If Yes, list the specified method:	
5. Is waste listed in Subpart D of 40 CFR 261? ☐ Yes ☐ No (If Yes, provide waste codes, regulated hazardous constituent(s), and an explanation of determination.) Attachment Included: ☐ Yes ☐ No Codes:	
6. Is waste characteristic per Subpart C of 40 CFR 261? ☐ Yes ☐ No (If Yes, provide waste codes, regulatory subcategory, and an explanation of determination.) Attachment Included: ☐ Yes ☐ No Codes:	
7. If hazardous, is the waste excluded for recycling in accordance with 40 CFR 261.2(e)(1)? ☐ Yes ☐ No If Yes, regulatory Citation:	
8. Is the waste mixed or low level? ☐ Yes ☐ No (If Yes, include attachment with isotopic information.)	
9. Is waste TSCA regulated for either of the following? PCBs: ☐ Yes ☐ No Asbestos: ☐ Yes ☐ No	
B. Evaluation of Underlying Hazardous Constituents (UHCs)	
Does the waste require evaluation in accordance with 40 CFR 268.48? ☐ Yes ☐ No (If Yes, identify UHCs.) UHCs: Attachment Included: ☐ Yes ☐ No	
C. DISPOSITION AND DATA GAP EVALUATION: (ATTACHMENT INCLUDED: ☐ YES ☐ NO)	
1. Proposed Disposition (storage, treatment, disposal pathway):	STP ID (mixed only):
2. Will this waste be treated in a <90 storage area? ☐ Yes ☐ No (If Yes, attach plan.) (Mixed and Hazardous Only)	
3. Is the information provided adequate for complete waste determination, management, transportation, treatment, and disposal of waste? ☐ Yes ☐ No If No, identify additional information or analysis required.	
D. Verification requirements: (Attachments Included: ☐ Yes ☐ No)	
1. Will verification be performed on this waste? ☐ Yes ☐ No If Yes, describe the verification to be performed.	
At Initial Storage Location: ☐ Yes ☐ No	Immediately Prior to Shipment: ☐ Yes ☐ No
2. What is the verification frequency?	

E. Packaging and Transportation Requirements (to be completed by P&T): Complete this section only if wastes are to be transported.
1. Is waste a DOT Regulated Hazardous Material? ☐ Yes ☐ No If Yes: DOT Primary Hazard: DOT Subsidiary Hazard:
2. Recommended Packaging:
3. Probable Basic Description (PSN, Hazard Class, DOT ID #. PG):
4. Other information (special shipping conditions, etc.):
5. If containers are already generated, are they packaged correctly for the DOT hazard class? ☐ Yes ☐ No If No, list container required.

Packaging & Transportation Name Typed/Printed	Packaging & Transportation Signature	Date

Summary of Waste Determination:	☐ Hazardous (see codes listed above)	☐ Mixed Low-Level (see codes listed above)	☐ Low-Level	☐ Conditional Industrial	☐Other (describe)

CERTIFICATIONS

I certify that the information in Section III of this form and the applicable attachments are fully disclosed and accurate. A good faith effort has been put forward to acquire and verify the information. Willful or deliberate omissions have not been made, and all known and suspected hazards have, to the best of my knowledge, been identified.

WGS Technical Specialist Name Typed/Printed	WGS Technical Specialist Signature	Date
WGS Independent Reviewer Name Typed/Printed	WGS Independent Reviewer Signature	Date
Low Level Waste Hazardous Waste Determination Review Name Typed/Printed	Low Level Waste Hazardous Waste Determination Review Signature	Date

Additional Narrative Information (As Needed):